

**IMPROVING THE MANAGEMENT OF ASSETS IN THE
NIGERIAN FEDERAL COLLEGES OF EDUCATION**

By

Halilu Hamma

Submitted in accordance with the requirements for the degree of PhD

**The University of Leeds
School of Civil Engineering**

February 2008

The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

This copy has been supplied on the understanding that it is a copy right material and that no quotation from the thesis may be published without proper acknowledgement

ABSTRACT

The economic imperatives imposed by global competition and the continuous drive for improved performance has promoted a need to consider the implications of strategic decisions on physical asset base in the public sector. The public services are evolving in a new context of rising public expectation, increasing focus on improving efficiency and value for money, and the continuous emergence of new technologies.

Given the rapid changes in the education sector, the future presents ever-increasing challenges for educational institutions to improve the management of their support services. These services are vital for them in providing better quality outputs to meet the needs of their students, academic staff, customers and visitors.

The Nigerian Federal Colleges of Education are therefore under direct pressure to find new and better ways to effectively and efficiently manage their physical asset base to meet service delivery needs, especially given that their budgets are coming under increasing constraint and pressure, and demands from service users not just very high but also increasing. These provided the impetus for this study.

The study is therefore concerned with examining the state of physical asset base in these Colleges and how the institutions understand and manage them, and then developing a strategic framework that will ensure optimum use of these resources for more effective and efficient service delivery.

The study developed an Asset Strategy Model which will guide the Colleges to develop their individual asset strategies that will align their asset planning and management practices with their service delivery priorities and strategies, within the limits of resources available. This has been achieved by review of relevant literature and conduct of field studies in some of the Colleges.

ACKNOWLEDGEMENT

First and foremost, I would like to thank The Almighty Allah (SWT), Who gave me the strength and wisdom to carryout this work.

Many thanks go to my supervisors, Professor Steven Male and Mr Kris Moodley for their tremendous support and guidance throughout the period of my studies, in Leeds

I am grateful to the Governing Council and Management of the Federal College of Education, Yola, for granting me Study Leave With Pay. I am particularly indebted to the Provost, Dr Aminu Ciroma and his predecessor, Prof Mustafa Abba, for their tremendous support and assistance.

I gratefully acknowledge the financial assistance I received from my sponsors, the Petroleum Development Trust Fund (PTDF), Abuja, without which my studies would not have been possible.

Alhaji M. K Jada deserves my special thanks for all the wonderful support and assistance. Also deserved of my sincere thanks are Dr Salihu Bakari, Abubakar Jijiwa, Muazu Raji, Isa Dikko, my brother, Arabo Hamma and my other brothers and sisters for their encouragement and invaluable support.

Finally, I would like to express my deepest gratitude to my mother, Hajja Inna, my wife Hauwa'u and my lovely children; Rashida, Gidado and Fatima for all their love and understanding.

DEDICATION

This work is dedicated to the loving memory of my late father, Alhaji Hama Dan Iya Girei and my late son, Umar. Both died during the period of this study.

TABLE OF CONTENTS

Abstract.....	i
Acknowledgement	ii
Dedication.....	iii
Table of Contents	iv
List of Figures.....	ix
List of Tables	x
List of Abbreviations.....	xi
List of Appendixes	xii
Chapter one: Introduction.....	1
1.1 Introduction.....	1
1.2 Research Context.....	1
1.3 Statement of the Problem	3
1.4 Aims of the Study.....	4
1.5 Objectives of the Study.....	5
1.6 Original Contribution to Knowledge.....	5
1.7 Outline of Research Methodology.....	6
1.8 Contextual Background.....	7
1.8.1 Socio-Political Framework of Nigeria.....	7
1.8.2 Nigerian Education System.....	8
1.8.2.1 The National Commission for Colleges of Education.....	10
1.8 Structure of the Thesis	11
Chapter Two: Understanding Asset Management	13
2.1 Introduction.....	13
2.2 Defining Asset Management.....	14
2.3 Approaches to Asset Management.....	15
2.4 Excellence in Asset Management.....	.17
2.5 Objectives and Principles of Asset Management	19
2.6 The Benefits of Asset Management.....	20
2.7 International Activities in Asset Management.....	21

2.7.1 Asset Management in the USA.....	21
2.7.2 Asset Management in Australia.....	23
2.7.3 Conclusions from the US and Australian Models.....	27
2.7.4 Asset Management in the UK.....	29
2.7.4.1 Property Asset Management.....	29
2.7.4.2 PAS 55	33
2.7.4.3 Asset Management in UK Local Government35
2.8 Best Practice in Asset Management	37
2.9 Asset Management Process	41
2.9.1 Identifying Objectives.....	42
2.9.2 Service Delivery Strategy.....	43
2.9.3 Asset Management Strategic Planning	44
2.9.4 Operational Planning.....	46
2.9.5 Implementation Plan.....	55
2.9.6 Audit/Review.....	51
2.10 Assessment and Decision Tools.....	56
2.10.1 Demand Management.....	56
2.10.2 Value Management.....	58
2.10.3 Risk Management.....	61
2.10.4 Asset Information	62
2.11. Conclusion.....	62
Chapter Three: Facilities and Estate Management.....	65
3.2 Facilities Management.....	65
3.2.1 Introduction.....	65
3.2.2 Defining Facilities Management.....	66
3.2.3 Scope of Facilities Management	68
3.2.4 Approach to Facilities Management.....	71
3.2.4.1 Developing Management Approach.....	72
3.2.5 Adopting FM.....	73
5.3.4 Implementation.....	82
3.2.4 Audit/Review.....	82
3.2.5 The Facilities Manager.....	85

3.2.6 Conclusions.....	86
3.3 Estate Management.....	87
3.3.1 Introduction.....	87
3.3.2 Defining Estate Management.....	87
3.3.3 Estate Management Framework.....	88
3.3.4 Strategic role of estate management	90
3.3.5 Estate Management Process.....	91
3.3.6 Implementation.....	95
3.3.7 Control.....	96
3.3.8 The Estate manager	98
3.3.9 Conclusions.....	99
3.4 Conclusions from EM and FM.....	99
Chapter Four: The Interim Asset Strategy Model.....	100
4.1 Introduction.....	100
4.2 Critical Analysis of AM, EM and FM	101
4.3 Understanding Asset Strategy	109
4.4 Process of Developing the Model.....	114
4.5 Conclusion.....	126
Chapter Five: Research Methodology.....	127
5.1 Introduction.....	127
5.2 Research Design	127
5.2.1 Research Orientation.....	130
5.2.2 Sampling the Population.....	134
5.2.3 Data Collection Methods	135
5.2.4 Data Analysis Techniques.....	144
5.3 Adopted Research Methodology.....	148
5.3.1 Data Collection Procedure	151
5.3.2 Case Study Approach.....	152
5.3.3 Sampling.....	153

5.3.4 Instruments and Procedures for Data Collection.....	155
5.3.5 Methods of Data Analysis.....	160
5.3.6 Reliability and Validity.....	161
5.3.7 Ethical Issues.....	162
5.4 Conclusion.....	163
Chapter Six: The Field Studies.....	164
6.1 Introduction	164
6.2 The Field Studies Process.....	165
6.2.1 Field Work Phase 1 – The Pilot Study	
6.2.1.1 The Pilot Study Process.....	168
6.3 The main Studies	178
6.3.1 Field Work Phase Two	178
6.3.1.1 Process of Data Collection.....	178
6.3.2 Field Work Phase Three – Study in the remaining two Main Study Colleges	184
6.4 Data Analysis Procedure.....	188
6.5 Conclusion.....	194
Chapter Seven: Discussion of Results, Review and Validation of Asset Strategy Model.....	195
7.1 Introduction.....	195
7.2 Presentation and Discussion of Results and Review of Model.....	195
7.2.1 Field Study Results.....	196
7.2.2 Analysis and Appraisal of Existing AM, and the related FM and EM Theories.....	203
7.2.3 Analysis and Appraisal of the Field Study.....	205
7.2.4 A Synthesis of the Existing Theory and the Field- Study Data.....	207
7.2.4.1 The Asset Strategy Model.....	207
7.2.5 The Modified Asset Strategy Model.....	211
7.2.5.1 Justification for the review of model.....	213

7.3 Research Validation and Final Evaluation of Model.....	217
7.3.1 Research Validation Exercise.....	217
7.3.1.1 Validation Conference - Summary of Discussion.	220
7.3.1.2 Evaluation of the Asset Strategy Model.....	222
7.3.1.3 Final Review of the Asset Strategy Model.....	223
7.3.1.4 Evaluation of the Asset Strategy Model.....	225
7.3.1.5 The Key Components and Processes- Developing the Asset Strategy Model.....	227
7.3.2 Responsibility for the Development of Asset Strategy.....	235
7.3.3 Interactive Work Shop.....	236
7.3.4 Adopting the Asset Strategy Model by the College.....	237
7.4 Conclusion.....	238
Chapter Eight: Organizational Change.....	240
8.1 Introduction.....	240
8.2 Theoretical Framework.....	240
8.2.1 Innovation.....	241
8.2.2 Change.....	242
8.3 Implementation.....	247
8.4 Monitoring and Evaluation.....	251
8.5 Activities Leading to the Development of Asset Strategy.....	252
8.6 Conclusion.....	255
Chapter Nine: Conclusion and Recommendations.....	256
9.1 Introduction.....	256
9.2 Achievement of Aims and Objectives.....	256
9.2.1 Aims of the Study.....	256
9.2.2 The main objectives of the study	257
9.3 Implication of Research to the Federal Colleges of Education.....	260
9.4 Contribution to Knowledge.....	262
9.5 Recommendations for Further Research.....	263

References.....	264
------------------------	------------

LIST OF FIGURES

Figure 2.1: Building a Single AM structure	17
Figure 2.2: Relationships between Strategic, Tactical and Operational Planning for Asset Management	
Figure 2.3: Total Asset Management Process	42
Figure 2.4: Flow chart for Developing and Using Asset Management Plans, AMP	45
Figure 3.1: Facilities Management in its context	69
Figure 3.2: FM Supporting the Organization's Core Business	70
Figure 3.3: Premises components of Facilities Management	70
Figure 3.3: How facilities management is carried out	74
Figure 3.4: Generic facilities Management Model	75
Figure 3.5: Strategic Planning Process	77
Figure 3.6: Development of Strategy	78
Figure 3.7: Real Estate Management as Integrating Mechanism	91
Figure 3.8: The planning triangle	94
Figure 3.9: Estate management key Organizational Variables	97
Figure 4.1: Interrelationship of EM, AM and FM: Author 2007	108
Figure 4.3 Stages in Developing the Asset Strategy Model	114
Figure 4.4: Interim Asset Strategy Model	125
Figure 6.1: Field Study Process Diagram	166
Figure 6.2: Data Analysis Procedure	189
Figure 7.1 Modified Interim Asset Strategy Model	212
Figure 7.2: The Asset Strategy Model	226
Figure 7.3: Responsibilities for Developing an Asset Strategy	235
Figure 8.1: Consideration for initiation	246

LIST OF TABLES

Table I.1: Ownership structure of colleges of education in Nigeria	9
Table 4.1: Concepts, tools and issues of EM, AM and FM	109
Table 5.1: The Processes of a Grounded Theory Study	147
Table 6.1: Pilot Study Interactive Workshop Programme	174
Table 6.2: Research Study Document Analysis Procedure	180
Table 6.3: Procedure for Physical Observation/Inspection of Assets and Facilities	181
Table 6.4: Phase 2 Field Study Interview Procedure	182
Table 6.5: Phase 2 Study Verification Workshop Procedure	183
Table 6.6: Summary of Results from Feedback Workshop at the 1 st main study college	184
Table 6.7: The Phase 3 Study Interview Procedure	186
Table 6.8: Phase 3 Study Verification Workshops Procedure	187
Table 6.9: Summary of Results from Feedback Workshop at 2 nd Main Case Study College	188
Table 6.10 Summary of Results from Feedback Workshop the 3 rd Case Study College	188
Table 7.1: Validation Exercise Administration Procedure	219
Table 8.1: Asset management milestones for the colleges	254

LIST OF ABBREVIATIONS

AM	Asset Management
ANAO	Australian National Audit Office
APM	Association of Project Managers
AS	Asset Strategy
CCGE	Central Civil Government Estate
DPWS	Department of Public Works and Services
EM	Estate Management
EO	Executive Order
FEFCE	Further Education Funding Council for England
FGN	Federal Government of Nigeria
FM	Facilities Management
FRPC	Federal Real Property Council (USA).
GAMC	Government Asset Management Committee (Australia)
GAO	Government Accountability Office (USA).
GSA	General Services Agency (USA).
HEFCE	Higher Education Funding Council
HEI	Higher Education Institutions
HMT	Her Majesty's Treasury
IVM	Institute of Value Management
KPIs	Key Performance Indicators
NAO	National Audit Office
NCCE	National Commission for Colleges of Education (Nigeria)
NSW	New South Wales (Australia)
NSWT	New South Wales Treasury (Australia)
OGC	Office of Government Commerce
OMB	Office of Management & Budget (USA)
PAM	Property Asset Management
PAS	Publicly Available Specification
RICS	Royal Institute of Chartered Surveyors
SAM	Strategic Asset Management
SRPOs	Senior Real Property Officers (USA).
TAM	Total Asset Management
VA	Value Analysis
VE	Value Engineering
VM	Value Management

LIST OF APPENDIXES

Appendix A: Categorization of Federal Colleges of Education	271
Appendix B: The RICS Building Maintenance Definitions	273
Appendix C: Coding and Categorization of Data during Data Analysis	275
Appendix D: List of Documents Examined and Factors considered in Physical Observation	276
Appendix E: List of Interview Respondents in each College studied and Interview Questions	277
Appendix F: Sample of Summarised Interviews and Scripts	278
Appendix G: Purpose & Summary of Discussions at Interactive Verification Workshops	281
Appendix H: Sample Analysis of Buildings and other Physical Facilities in one of the Colleges	283
Appendix I: Sample of Document Analysis for one of the Colleges	287
Appendix J: Summary of Condition of Buildings in the Colleges Studied	289
Appendix K: Summary of problems, opportunities and proposals identified at the workshops	291

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter describes the context of the study, the research problem, and the Aims and Objectives of the study. It outlines the research methodology, and the structure of the thesis. It also includes a brief overview of the system of education in Nigeria and the place of Federal Colleges of Education, the focus of this research.

1.2 Research Context

The need for effective management of physical assets and associated facilities in tertiary education institutions in Nigeria cannot be over emphasized. Educational institutions rely on their assets for effective teaching and learning; assets also create the first impression of the institution to the public. The direct relationship between learning environments and learning outcomes is very much obvious. Education is about excellence and inadequate/inappropriate or poorly managed assets and facilities will undoubtedly affect the ability of institutions of higher learning to achieve their goals and objectives. This clearly underscores the need for effective management and maintenance of physical assets in educational institutions.

Given the central role of assets in ensuring effectiveness or otherwise of attaining an organization's mission, this researcher, having served in the estate department of a Federal College of Education for ten years, is interested in developing strategies which will ensure that assets and facilities in these colleges are developed and managed optimally, in order to effectively and efficiently meet their service delivery requirements. To achieve this therefore, there is need for strategic plans for the development and management of assets and facilities which should be rooted in and supportive of the colleges' overall corporate goals and objectives, and must take account of the financial resources available. Adoption of asset management principles by the colleges is therefore essential for the attainment of their corporate goals.

Asset management is the process of guiding the acquisition, use, safeguarding and disposal of assets to make the most of their service delivery potentials and manage the related risks and costs over their entire life. The goal of asset management is to meet a required level of service in the most cost effective way through the creation, acquisition, operation and maintenance, renewal and disposal of assets to provide for present and future demands. A better service, not a better asset, is a key indication of successful asset management. If properly applied, asset management will provide the Colleges with the strategic link between strategic academic planning and asset management. In the context of any organization or business unit, the focus of asset management is to reconcile the demand for, and supply of, physical asset base and associate support services essential for the delivery of its core products or services. Simply expressed, the principal role of asset management in this case will be to support the core business of the colleges, which is teaching and learning.

This study therefore is about investigating the management of assets in the Nigerian Federal Colleges of Education; identifying problems associated with the current practices and proffering workable solution that will ensure more effective and efficient service delivery. The study specifically focused on identifying how the Colleges understand and manage these important resources and on developing a framework that will guide the colleges to establish sustainable systems of managing their assets optimally.

Accordingly, the study examined the existing literature on asset management and associated estate and facilities management. A robust and holistic approach to the management of assets has been developed by many Government and private establishments, including the Australian Commonwealth Government, State Governments and other related agencies, as well as the British Standards Institution, with a view to ensuring optimum performance of physical assets to meet stakeholder needs and expectations. The study has therefore drawn much from these models which dwells extensively on the need, the processes and benefits of asset management and from much other relevant literature. The models also which provided the study with the basis and necessary impetus for the development of asset strategy for the Colleges.

Asset management strategy as shown in the literature is a key element of the strategic resource plan of any organization. The strategy provides a better understanding of how to align the asset portfolio so that it best meets the service delivery needs of the stakeholders, both now and in the future, to enable the organization's asset management policy to be achieved. An asset strategy model for the Colleges has therefore been developed through the interrogation of the literature and conduct of field studies in some selected colleges. A College that adopt the model will be able to use it to develop its own asset strategy which is expected to outline and guide the college's asset response to its service delivery requirements. The Asset Strategy will review the college's existing asset portfolio for its adequacy in supporting services cognizant of non-asset or less-asset dependent solutions and asset risk to service delivery. The Asset Strategy will define the relationship between the college's Corporate Objectives, Academic Plan and its Capital Investment, Maintenance and Asset Disposal Strategic Plans. It will identify any needs or 'gaps' and address these through planned investment (including maintenance, replacement and/or upgrading) necessary to maintain service delivery, in both the short and longer terms.

1.3 Statement of the Problem

Vigorous economic growth in the private sector has influenced public opinion towards greater reliance on private-sector principles as the preferred basis for managing public systems. Many public agencies are moving towards the implementation of asset management systems. The major driving force is pressure to operate on a business like basis. Accordingly, business practices from the private sector are being utilized. The consequence is that public agencies have found themselves faced with the need to justify how they conduct business.

In adjusting to these changes, public organizations are embracing management concepts from the private sector which ensures that public expectations are matched with an efficient use of limited resources. Effective asset management requires an understanding of an organization's business and demands on its operations. This has led to an increasing emphasis on identifying and understanding the core business of public agencies with a view to providing a holistic, inclusive and coordinated approach to managing physical assets.

The colleges under study have significant investment in physical assets which are essential for the realization of their corporate goals and objectives. The management and maintenance of these assets constitute a very substantial cost on revenue budgets. It follows that any improvement in the strategic and operational management of capital assets could have a real impact on the financial resources available to the colleges. There is therefore the need for them to seriously embrace asset management concepts and principles in order to meet up with the emerging trend and achieve their corporate goals effectively and efficiently.

Further, the continuous challenges faced by the Colleges to accomplish more with less, as evidenced by the increases in demand, regulatory requirements, infrastructure deterioration, and political and economic forces. These have significantly outpaced increases in capital and operating budgets. The Colleges therefore need to turn to Asset Management principles and practices to cope with these challenges and improve business performance and effectiveness. They should focus on several aspects of developing an asset management system that could help improve performance, reduce long-term costs, and maximize return on investment in assets and facilities. At the moment, no structured formal asset management framework exists in the Colleges to enable procurement, maintenance, renewal, enhancement and disposal decisions to be made in an informed and coherent manner.

The challenge to this study therefore is to develop a structured and systematic approach by which a college can align its asset planning and management practices with its service delivery priorities and strategies, within the limits of resources available. This will help the Colleges to achieve better planning and management of their physical assets and facilities, both existing and those to be acquired. In this regard, this study undertook to examine relevant literature, conduct field studies to understand the asset situation in the Colleges vis-à-vis their corporate objective, then subsequently develop an Asset Strategy Model which will serve as a benchmark and proper guide for the Colleges to develop their individual asset strategies.

1.4 Aims of the Study

The aim is to develop a framework for a structured, integrated and holistic approach to managing physical assets in the Nigerian Federal Colleges of Education, which will

ensure an effective and efficient alignment of assets with the service delivery requirements of the colleges.

1.5 Objectives of the Study

The main objectives of this study are to:

- Examine the state of physical assets and facilities in the Federal Colleges of Education and review their ability to meet the service delivery requirements of the Colleges
- Examine the current management practices and levels of knowledge of the assets own and rented by the Colleges.
- Identify the main factors that inhibits effective and efficient management of assets and facilities in the colleges
- Examine the existing literature in respect of Asset, Estate and Facilities management, with a view to drawing lessons that will help improve management of assets in the Colleges in question
- Develop management strategies that will enhance effectiveness and efficiency of assets in meeting service delivery requirements of the Colleges.

1.6 Original Contribution to Knowledge

The original contributions of this research to the existing body of literature are:

1. Revealing how the Federal Colleges of Education in Nigeria understand and manage their physical asset base compared to what is applicable in other contexts as documented in the literature.
2. Bringing together, estate and facilities management concepts along with the asset management concepts, to produce a management system that will ensure effective, efficient and economic performance of assets and facilities in Nigerian Federal Colleges of Education.
3. Developing an Asset Strategy Model that is adoptable by the Nigerian Federal Colleges of Education, including the processes and responsibilities for developing such strategy by individual colleges, then testing the developed Asset Strategy Model on the case study colleges and other colleges not involved in the study

4. Raising the awareness of College staff and other stakeholders on the need and necessary processes for the development of asset strategy that will ensure effective alignment of college assets and facilities to its service delivery requirements.

1.7 Outline of Research Methodology

The key concern in choosing the research methodology has been that the study should develop practicable system that will ensure improvement in the management of assets and facilities in the colleges under study. The choice of methods has therefore, been guided by the nature of the research problem and that of the topic being researched. Qualitative methods were felt to be most appropriate to allow for theories and themes to emerge, employing a grounded theory-based holistic approach, as described in *Chapter 5*.

Also employed in this study, is the case-study approach, involving three colleges, in addition to the pilot study college. These are considered adequate representation of all the Federal Colleges of Education in the country, because of their high level of commonality. The selection of the Colleges studied and individuals involved in the whole exercise was based on purposive sampling, conducted in a manner that ensures adequate representation and richness of data.

Realization of the objectives of this thesis comprised three integral stages: a literature review, field study of selected colleges, and a validation exercise. Literature review of Asset Management, Estate Management and Facilities Management was conducted with a view to identifying and understanding relevant aspects that could be employed in achieving the stated objective of this research. The inclusion of Estate and Facilities Management is informed by the fact that they share common objective with Asset Management, in the provision of an enabling workplace environment to fulfill corporate objectives of an organization, as shown in *Chapters 2 & 3*.

The field study stage was aimed at examining the assets situation in the Colleges; identifying levels knowledge of assets own and capabilities of the Colleges to effectively and efficiently manage them; and collaborating with the stakeholders to

develop strategies that will optimize management of asset in the Colleges. It involved a mix of document analysis, observation, interviews, and iterative feedback process in the form of workshops involving a pilot study college and three other Colleges, selected based on an opportunistic sampling approach.

The validation exercise was conducted at the end of the study to supplement the feedback and verification workshops, in ensuring the validity of the proposed framework that has been developed for adoption by the Colleges. The exercise involved presenting the developed asset strategy model to participants who were drawn from the case study Colleges, other colleges not involved in the study and other relevant organizations. During the presentations participants were encouraged to comment on and make suggestions to the proposed model.

1.8 Contextual Background

1.8.1 Socio-Political Framework of Nigeria

Nigeria, a former colony of Britain, gained her political independence in 1960. Geographically, its landmass is about 222,919 square Kilometers. It is bordered by Benin, Niger, Chad and Cameroon Republic. Nigeria's population as at 2006 stood at 140 million (NPC 2006). The country, according to Yeloye, in Postlethwaite (1995), is multiethnic and multi religious, whose 140 million population speak at least 394 languages and belong to over 250 ethnic groups. The country is historically composed of three regions: North, East and West. However, ethno religious diversity has led to political subdivisions based on parochial interests. This resulted in emergence of six geopolitical zones, from the hitherto three regions. Administratively, the country is governed through three tiers of government, i.e., Federal, State and Local Government. The political unit is composed of 36 States, 774 Local Government Councils and the Federal Capital. The key administration's strategy is on decentralization and development from the grassroots.

Economically, Nigeria's Human Development Index is low, evidenced by its HDI position of 152 out of 175 countries (UNDP, 2006). The GDP per capita (purchasing power parity, PPP) stood at £896.00 The nation is heavily dependent on petroleum

resources, which provides 20 percent of GDP and 95 percent of foreign exchange earnings and 65 percent of budgetary revenues.

1.8.2 Nigerian Education System

The Federal Government of Nigeria views education as “an instrument par excellence for effecting national development.....and a dynamic instrument of change” (FGN 1996). Specifically, the Government, like in many other developing economies, recognizes education as a panacea to all underdevelopment-related problems. The national education policy is based closely on Nigeria’s national goals and identifies the following as the core beliefs underlying the country’s philosophy on education:

- Education is an instrument for national development; to this end, the formulation of ideas, their integration for national development, and the interaction of persons and ideas are all aspects of education;
- Education fosters the worth and development of the individual, for each individual’s sake, and for the general development of the society;
- There is need for equality of educational opportunities to all Nigerian children, irrespective any real or imagined disabilities, each according to his/her own ability
- There is need for functional education for the promotion of a progressive, united, Nigeria; to this end, school programs need to be relevant, practical and comprehensive; while interest and ability should determine individuals’ direction in education’ (FGN 1986)

The Nigerian Education philosophy is therefore based on: the development of the individual into a sound and effective citizen; the full integration of the individual into the community; and the provision of equal access to educational opportunities for all. The adoption of this philosophy is based on the belief that the multi-ethnic and multi-cultural composition of Nigeria needs to be blended and integrated if the nation is to record a steady economic, political and social growth and stability.

Higher education institutions are therefore established to achieve the above by providing educational programmes at various levels. All institutions offering post-secondary degrees, certificates and diplomas constitute the higher or the tertiary education system. There are three institutional types – universities, polytechnics and colleges of education.

By 2007, there are 89 Universities, 42 Polytechnics and 64 Colleges of Education in Nigeria. Overall, Nigeria has a far larger and more diversified tertiary education sector than any other country in Africa.

Colleges of education run three-year programmes leading to the Nigerian Certificate in Education (NCE). Polytechnics on the other hand, run two- and four-year year programs leading to National diploma and Higher National diploma. Universities run a wide range of programs lasting between 4 to 7 years. The major functions of Higher Education Institutions, according to National Policy on Education are: teaching; research; the dissemination of existing and new information; the pursuit of service to the community and being a storehouse of knowledge (FGN 1982).

Colleges of Education, particularly those owned by the Federal Government are the major focus of this researcher, having served in one of them for a period of ten years. The ownership structure of Colleges of Education in Nigeria is as shown in table 1.

Federal Government	State Governments	Army	Private
20	39	1	4

Table 1 Ownership structure of Colleges of Education in Nigeria. Source: NCCE 2006

As shown in the above table, there are 64 Colleges of Education in the country, out of which twenty were established and controlled by the Federal Government while four have been privately established with one, owned by the Army. As at 2006/2007, the total student enrolment in colleges of education stood at 191,578, while the academic staff strength was 8,872 (NCCE 2006)

Colleges of Education are specifically tailored towards meeting the demands for production of qualified and effective teachers for the nation. The goals and objectives of Colleges of Education according to a Government report (FGN 1996) are:

1. Teaching, encouragement of the spirit of inquiry in teachers;
2. Production of highly motivated, conscientious and efficient classroom teachers for the Primary and junior secondary levels of the educational system.

Other objectives of the colleges are as follows:

- a) To provide full-time courses in teaching, instruction and training:
 - In technology, applied science, commerce, arts, social science, humanities, and management leading to the award of the Nigeria Certificate in Education (NCE)
 - In such other fields of applied learning relevant to the needs of the development of Nigeria in the areas of industrial and agricultural production and distribution and for research in the development and adaptation of techniques
- b) To conduct courses in Education for qualified teachers
- c) To arrange conferences, seminars and workshops relative to the fields of learning specified in paragraph (a) and
- d) To perform such other functions as in the opinion of the Council may serve to promote the objectives of the Colleges.

The Federal Government established three autonomous bodies to coordinate the activities of higher education (tertiary) institutions. These are as follows:

1. The National Universities Commission (NUC) for Universities
2. The National Board for Technical Education (NBTE) for Polytechnics and Colleges of Technology
3. The National Commission for Colleges of Education (NCCE) for Colleges of Education.

These Commissions serve as regulatory bodies and are charged with the responsibility of setting minimum standards for curricula and disbursing funds to the institutions under their control. They also organize accreditation of academic programs. In addition, these bodies are charged with the responsibility of overseeing the development of physical facilities in the institutions.

1.8.2.1 The National Commission for Colleges of Education (NCCE)

The National Commission for Colleges of Education (NCCE) was established by Decree 3 of 1989, to among other things, advise government on financial needs of Federal Colleges of Education, accredit academic programmes of the Colleges and to

receive block grants (for capital and recurrent expenditure) from Government and allocate them to the Colleges on annual basis. The statutory functions of the Commission also include the planning of training facilities, preparation of periodic master plans for balanced and coordinated development of Federal Colleges of Education, and monitoring and control of project execution, with a view to ensuring that physical development programmes are not only well planned, but that their execution are prudently controlled within the allocated available resources. The ultimate objective of this is to ensure that Colleges account fully for capital funds released to them.

In discharging its responsibilities therefore, NCCE had developed some guidelines and procedures for the implementation of capital projects in the Colleges, with the aim of ensuring judicious use of the scarce resources. To qualify for allocation of grants therefore, Colleges are required to properly account for previous allocations and also to submit to the commission, their annual budgets and three year development plans. The three year plan should among others, indicate the College's proposed capital projects and growth projections in terms of academic programmes, staffing and student enrolment.

1.8 Structure of the Thesis

This thesis is structured into nine chapters as follows:

Chapter two – Sets out literature review of asset management with particular attention on the strategic asset planning, which discusses the alignment of the asset planning and management with the service delivery priorities.

Chapter three – Sets out a similar review in areas of estate management and facilities management. These are considered very much relevant to the study. The chapter shows that understanding the role of buildings and how they can be deployed effectively, in the context of operations of each individual business, is the essence of both facilities and estate management.

Chapter four – This chapter discusses the importance and composition of asset strategies and how the interim asset strategy model was developed, prior to the filed studies. It concludes with an interim asset strategy model

Chapter five – Discusses the appropriate research methodologies the researcher employed for the study. It provides the wider theoretical justification for the proposed methodology with reference to the various options for social science research methods. The chosen research strategy is then described, outlining the procedure implemented during the field study stage, and validation exercise

Chapter six – This is a continuation of the research methods chapter. The chapter discusses the activities of field studies, covering the pilot study and main studies in three other colleges, including the conduct of verification and validation workshops.

Chapter seven – In this chapter, results from the field has been presented and discussed. The field study data is analyzed and compared with what is obtained in the literature earlier discussed in chapters two and three. The validation exercise is also discussed in this chapter which concludes with provision of a modified asset strategy model, justification for the changes made to the model and the responsibly for the development of the model by individual colleges.

Chapter eight – The theoretical framework for organizational change is discussed in this chapter, including general discussions on innovation and change. Some factors that will engender organizational changes in the colleges as a result of asset strategy implementation have identified along with how the organizational change can be implemented in the context of this research.

Chapter Nine – Conclusions and recommendations for further research are contained in Chapter 9 where the realization of each of the stated aims and objectives are discussed and contributions to body of knowledge outlined.

CHAPTER Two

UNDERSTANDING ASSET MANAGEMENT

2.1 Introduction

The relevant asset management disciplines and procedures have generally emerged from the highly structured or regulated institutions – initially the armed forces, airlines and nuclear sectors but now rapidly spreading to power, water, housing and other sectors (Woodhouse 2001).

Assets Management as relates to physical assets is a relatively new concept. It covers the procurement, operational management, maintenance, rehabilitation and disposal of assets such that their use is maximized in regards to their service delivery potentials and that risks and cost are managed over their entire life (Woodhouse 2001)

In the past, increasing public demand for services invariably meant the creation of new infrastructure, with inadequate attention given to asset life and whole-of-life costs. Too often, assets were seen as ‘outcomes’ rather than simply platforms from which services were delivered. The existing asset base was often under-utilized or under-performing, with only minor asset rationalization programmes in place.

Public and private sector organizations are now committed to optimizing their asset base and recognizing that physical assets have a vital role to play in providing service delivery that fulfils their corporate objectives. Good asset management requires the planning and acquisition of the most appropriate assets to meet current and future service delivery demands. This requires informed decisions about which assets are needed, where and in what numbers.

This chapter therefore outlines a formal systematic process for asset management and also discusses the asset management activities that are necessary for a robust asset management process. Understanding Asset management is the basic tool for this research work. The chapter also includes a toolkit of approaches that can be used to undertake asset management activities including development of an asset strategy.

A key element of asset management which is given particular attention in this section is the strategic asset planning, which discusses the alignment of the asset planning and management with the service delivery priorities, so that all asset support services in the most appropriate, effective and efficient way. The next section gives definitions and explanations of asset management.

2.2 Defining Asset Management

Asset management represents some fundamental rethinking about how public agencies and private organizations function. The scope, technology tools and procedures must be able to deal with a range of practical issues identified in the previous section.

The traditional design-build-maintain approach is simply inadequate in the face of the current challenges for more proactive practices in managing assets. A transition to modern asset management principles and techniques is needed. One of the first steps to understanding and using asset management principles is to have a clear definition of the term. Unfortunately, this has not been an easy task as both a variety of definition and some confusion over the scope of asset management exist. First, as guiding principles, Ralph Haas (2000) states that:

1. Asset (AM) Management should be viewed as a process and an Asset Management System (AMS) as the operational application or implementation of the process.
2. The fundamental requirement of an AMS by administrators and engineers is that it employs good business practices and effectively integrates or incorporates the already established component management systems.

The following example definitions address these guiding principles wholly or in part:

- “Asset management is the optimum way of managing assets to achieve a desired and sustainable outcome” (IAM 2003)
- “Asset management is a comprehensive business strategy employing people, information and technology to effectively allocate available funds amongst valid and competing asset needs”(TAC 19997)

- “Asset management is a comprehensive and structured planning process for developing capital and recurrent budgets. It aims to focus on customer and community needs, provide quality services and a commitment to excellence to ensure that assets remain productive”.(RTA 1996)
- “Asset management is a comprehensive and structured approach to the long-term management of assets as tools for the efficient and effective delivery of community benefits. The emphasis is on the assets being a means to an end, not an end in themselves.” (Austroads 2006)

Practitioners generally tend to define asset management in terms of the property/infrastructure for which they are accountable. However, according to TAM 2000, it generally covers the procurement, operational management, maintenance, rehabilitation and disposal of assets, such that their use is maximized in regard to their service delivery potential and that risks and costs are managed over their entire life. It is a business process and decision-support framework that covers the extended life of an asset and draws from engineering as well as economics. In essence, asset management should be directed to gaining the greatest possible benefits for the owners and users of the assets.

2.3 Approaches to Asset Management

Conventionally, the prime objective of managing assets has been to control short-term running cost. The main concerns, according to Lloyd (2003), have been with immediate, operational and maintenance matters. He further observed that there are a number of reasons for that approach;

- Expenditure on assets is generally the second highest business cost after payroll, so that it is an obvious target for cutting cost to boost annual profit
- Physical assets are often perceived by managers to be a ‘sunk cost’ that has little impact on strategic decision-making
- Operating and maintenance cost of assets are easily measured, whereas the long-term strategic benefits of buildings and facilities are less readily quantified and their effect on the ‘bottom line’ is not so apparent, so that they tend to be overlooked
- Property is a relatively permanent asset and the transactional cost of acquiring or disposing of property assets are high, which tends to reinforce the status quo

The approach to managing physical assets is now changing. The Asset Management approach is being adopted all over the world and it involves consideration of short-term, operational as well as long-term, strategic issues, and includes both costs and benefits. It is simply the way we look after the assets around us both day to day in maintenance and operations and medium to long term in strategic asset planning. Asset management is directly related to current or desired level of service to customers; the cost of providing the services, and the practices and systems that assist in achieving this in the most efficient and cost effective ways.

Organization's assets are of utmost importance and should be managed to maximize the organization's stakeholder value as well as its well being, irrespective of whether it is a public or private organization. The main streams in asset management are (NSWT 2004):

- Identification of needs for the asset, in the light of stakeholder requirements
- Provision of assets, including its ongoing maintenance and rehabilitation to suit continuing needs
- Operation of the asset
- Disposal of the asset when the need no longer exists or it is no longer appropriate for the asset to be retained.

Good asset management will always result in achieving best value from the total asset costs over their life cycles, including the cost delivering services using these assets. Sustainable asset investment requires organizations to be accountable in maintaining and wisely using their existing assets. Optimal asset management is achieved by (DTF 2005):

- Defining desired levels of service in consultation with the stakeholders, and matching these with assets that enable the services to be delivered.
- Adopting a life cycle approach to planning asset investment and management decisions.
- Balancing competing needs across all organizations functions and selecting options which best meet desired outcomes.
- Monitoring, evaluating and improving service delivery.
- Managing the risks of asset ownership and operating to ensure continuity of service.
- Providing for present needs while sustaining resources for future needs
- Adopting continuous improvement approach to asset management policies.

Woodhouse (2001) describes asset management as the set of processes, tools, performance measures and shared understanding that glues the individual improvement or activities together. This is depicted in the Figure 2.1.

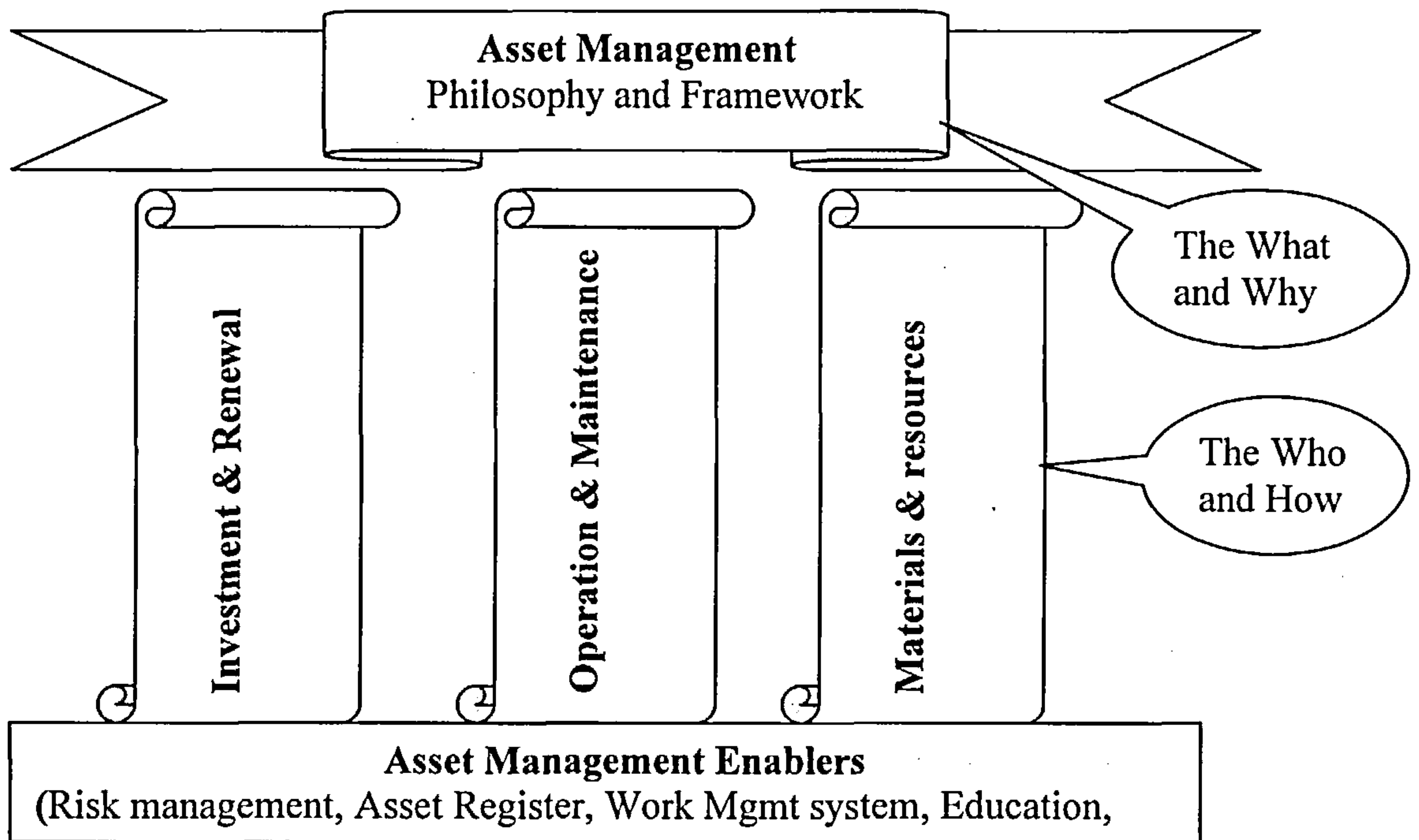


Fig 2.1 Building a single AM structure – adopted from Woodhouse (2001)

Simply stated, asset management fulfills a much needed intermediate role between strategic management and operational management in any organization. Representation in asset management should comprise of strategic inputs from senior management staff responsible for strategic planning.

2.4 Excellence in Asset Management

It is essential that a business management approach be taken to ensure public and private organizations receive maximum value for their investment in physical assets and that services can be provided at the lowest life cycle cost. Practicing asset management is not just fulfilled by complying with statutory requirement, but also directly related to:

- current or desired level of service for the stakeholders
- cost of providing these services
- the practices and systems that assist in achieving this in most efficient and cost effective ways.

Male et al (2006) report suggests that asset management should be a top-down policy driven and bottom-up needs verified approach. “The former perspective sets out the policy framework within which property asset decisions will be made, including an associated basis for prioritizing investment and the consequent shape and configuration of the property portfolio held by a department. The complementary latter approach derives from those responsible for the operational delivery of services and property confirming through feedback mechanisms whether the property portfolio, its performance over time and the investment made meets adequately service delivery needs and requirements”. In order to get the best from an organization, the top team needs to hold the reins lightly enough to allow the detailed articulation of asset management (at the operational level) to be fed back into the leadership process.

Asset management is a full cycle management of such assets in order to maximize their advantage. According to TAM 2000, it covers site acquisition and disposal, the replacement and remodeling of buildings, roads and bridges to include extensions and improvements, plus the management and maintenance of such physical assets.

Good asset management usually meets the following criteria (Scottish Executive 2005):

- The authority knows what is in its asset portfolio, where those assets are, and who is responsible for their upkeep.
- The authority has developed a means of relating the assets in its portfolio to its wider objectives, thus providing a basis for investment and disposal decisions and for setting priorities between them.
- The asset portfolio is reviewed regularly, both on a department wide and an authority wide basis, according to criteria set centrally and used consistently across the authority.
- The authority has considered both long term (5-10 years) and short term objectives
- It links the use of assets to the use of other resources
- Decisions about reviews, additions, disposals, maintenance programmes and collaboration with other partners are taken systematically and implementation is monitored by members.

Asset management effectively represents a shift from a “management by exception” in operations and planning, that is prevalent in most public organizations. It now

guides the manager to purposely deploy scarce public resources to achieve the greatest public benefit. A fully-implemented asset management system will allow decision makers to explore how each action – e.g., operating and maintaining existing assets as well as building new ones – is likely to influence both current budgets and long-term stakeholder needs. Assets exist to support delivery of organization's services. Therefore, effective asset management ensures that the following key propositions apply (DPW 2006):

- Assets should align effectively with and support organizational business needs for the short and long-term : and
- The long term cost of using, maintaining and operating assets should influence decisions on acquiring assets so that the most economical long-term cost is achieved.

Guidelines in subsequent sections have outlined how the above objectives can be achieved by applying various principles and processes in planning, capital investment and maintenance.

2.5 Objectives and Principles of Asset Management

The principal objective of asset management is to enable an organization to meet its service delivery objectives effectively and efficiently. To be effective, asset management needs to be considered as a comprehensive and multi-disciplinary activity that takes into account a range of factors such as (NSWT 2004):

- the asset life cycle and asset management principles;
- the needs of the users of the asset;
- the policy and legislative environment;
- the organization's corporate management and planning framework;
- technical adequacy and commercial viability;
- external or market factors (commercial, technological, environmental or industry implications);
- the competing demands of stakeholders and
- the need to rationalize operations to improve service delivery or to enhance cost-effectiveness.

Managers responsible for assets have recourse to a range of techniques to assist them. These include value management, demand management, economic appraisal, life

cycle costing and risk management. Risk management is particularly important as it underpins many of the key decisions made about assets.

Public sector asset management should be governed by the following principles (DPW 2003):

- Service delivery needs are to guide asset practices and decisions
- Asset planning and management are to be integrated with corporate business plans, budgetary and reporting processes.
- Asset decisions are to be based on alternatives that take into account full life cycle costs, benefits and risks of assets
- Ownership, control, accountability and reporting requirements for assets are to be established, clearly communicated and implemented
- Asset management activities are to be undertaken within an integrated government asset management policy framework

2.6 The Benefits of Asset Management

Asset management is a key component of efficient organization. Good asset management will enable an organization to (NSWT 2004):

- Assess the make-up of the best portfolio required to deliver the given services
- Minimize operational costs, and maximize asset efficiency
- Maximize efficiency of service delivery
- Facilitate long term planning in the context of corporate objectives
- Develop corporate thinking
- Develop valuable long term partnerships
- Free up resources for reinvestment, should the financial policy of the authority allow it, and subject to the Prudential Code
- Allocate resources effectively to areas of greatest need
- Account to the public for its use of public assets

Countries that adopt asset management practices have recorded tremendous improvement in the efficiency and effectiveness of their physical assets. The next section therefore discusses asset management in some countries that have developed and entrenched asset management practices in Government policies.

2.7 International Activities in Asset Management

As earlier stated, the relevant asset management disciplines and procedures have generally emerged from the highly structured or regulated institutions – initially the armed forces, airlines and nuclear sectors but now rapidly spreading to power, water, housing and other sectors.

Australia, New Zealand, USA and the UK have incorporated the concept in their operation and are leading the world in the holistic approach to asset management. This section has therefore outlined a number of international activities related to asset management.

2.7.1 Asset Management in the USA

In the past several years, the United States Federal Government's real property management practices had undergone extensive scrutiny with a view to improving the management of its hundreds of thousands of infrastructure and real property assets worldwide, and worth hundreds of billions of dollars. A large portion of these assets were in serious state of deterioration, with repairs estimated at tens of billions of dollars. Many agencies consider the assets as no longer able to meet their service delivery requirements effectively and efficiently. These property assets were in 2003, designated as a high risk area by the Government Accountability Office (GAO)

Following the GAO report, President Bush signed an Executive Order (EO) 13327, in February 2004, for real property asset management, adding it to the President's Management Agenda (PMA) (Teicholz 2005). The EO's primary objective is to promote efficient and economical use of the Government's real property assets. It calls for executive branch agencies to appoint a Senior Real Property Officer (SRPO) to be held accountable for the effective management of the agency's real properties. Each agency must determine what it owns, what it needs and what it costs to manage its real properties. It must develop and implement asset management plans, develop and monitor real properties performance measures and dispose of properties that are not needed.

As part of EO13327, the inter-agency Federal Real Properties Council (FRPC) was formed and is responsible for developing guidance, serving as clearing house for best

practices, and facilitating the efforts of the SPRO. The FRPC has established four working committees to focus on various aspects of the Executive Order (GSA 2004):

- Asset management
- Performance measures
- Inventory, and
- Systems

These committees are charged with the responsibility of developing asset management baseline data, performance measures reporting, real property inventory database standards, as well as promoting other tools for effective asset management.

Federal highway Administration (FHWA), US Department of Transport

FHWA has initiated several programmes to address the issue of infrastructure asset management in the US. In 1999, FHWA established the Office of Asset Management. It is one of four offices within FHWA's Office of Infrastructure. Its mission is to bring state-of-the-art management system technology and best practices to US states and local agencies and to provide leadership and expertise in the management of highway infrastructure assets. The office has three key responsibilities:

- Provide national leadership in asset management for the highway programmes
- Develop asset management policies for the pavement and bridge systems; and
- Partner with the American Association of State Highway and Transportation Officials (AASHTO) and others to conduct nationwide programmes.

To summarize, Asset Management practices in the US was initially introduced in the highway infrastructure sector, to provide leadership and expertise in the management of the Highway infrastructure assets. The challenge faced by the Federal Government to not only arrest the deteriorating condition of its physical assets but to also plan a programme of repairs and improvements, also triggered the development of a property asset management process mandated by Presidential Order. A national council has been established to oversee the development and dissemination of best practice in property asset management, a series of Key Performance Indicators (KPIs) have been established for measuring the performance of property assets over time and a senior manager within each major agency must be nominated who will be held accountable for the management of property assets on behalf of the agency.

2.7.2 Asset Management in Australia

Unlike what is obtained in the United States, accounting standards and/or public sector financial reporting system have been a key driver of asset management in Australia. Both federal and state governments have implemented strategies aimed at securing gains in efficiency and productivity. Australian Accounting Standards (AAS) has given engineers and accountants the opportunity to introduce business management system to the management of physical assets. The financial standards, which requires assets to be accounted for and included in financial statements includes (IAM 2002):

- AAS 27 for local government
- AAS 29 for government departments
- AAS 31 for governments.

A robust and holistic approach to the management of assets has been developed by Australian Commonwealth Government, State Governments and other related agencies, with a view to ensuring optimum performance of physical assets to meet stakeholder needs and expectations. These are therefore discussed in the next section.

Australian National Audit Office (ANAO)

The Australian National Audit Office (ANAO) is a public sector organization meeting audit service needs of parliament and commonwealth public agencies. The aim is to improve commonwealth public sector administration and accountability. The ANAO assists the Auditor-General by providing objective evaluation of the performance and financial management of public sector agencies. The ANAO's *Asset Management Handbook* (ANAO1998) helps asset managers implement asset management principles. The handbook provides an overview of asset management principles, instructions on application of asset management principles and concepts, a selection of case studies, and a glossary of terms. The ANAO found that (ANAO 1998):

- Most organizations can benefit from proper asset management strategies
- Asset management strategies should integrate with other strategic planning processes
- Alternatives should be considered when purchasing and replacing assets
- Life-cycle costing analysis should be used
- Improved asset management can occur from proper codification of cost of assets

- Decision about asset decommissioning should be made at a strategic level, and
- Regular inspection of the condition and performance of assets, combined with proper planning for replacement, can maximize the return on investment.

The ANAO also published a better practice guide entitled *Asset Management Guide*. The guide and handbook are based on the asset management principles developed by the ANAO. By 1997-98 the ANAO re-examined through a further audit the extent to which its earlier recommendations had been implemented. "The subsequent report noted that effective strategic asset management remained a challenge for many government organizations" (Male 2006). The audit had also confirmed the limited nature of central policy advice and guidance compared that which existed in a number of State Governments. A consensus from a number of their reports confirms that there has been a much stronger drive towards improved asset management, including property asset management at State compared to the central Commonwealth Government.

The subsequent sections give examples of state Government and other organizations approaches to Management of assets.

New South Wales Government

The NSW Government established an Asset Management Committee (GAMC) in 1998 to bring together NSW Government agencies and asset experts to ensure a "whole of government" approach to asset management and office accommodation planning. The Committee meets quarterly or more often when required and its terms of reference are to provide advice to the Budget Sub-Committee of Cabinet on (GAMC 2003):

- The alignment of asset and office accommodation resources with Government's service delivery priorities.
- The appropriateness of agency asset management strategies.
- Strategic asset and accommodation issues involving more than one agency.
- Office accommodation strategies for metropolitan and regional areas.
- Major investment strategies - acquisition, major refurbishments, lease pre-commitments, leasehold, and asset and property disposals.
- Benchmarks and performance standards for asset and property portfolios.

A Senior Officer Sub-Committee has also been established under the GAMC to meet regularly and consider matters prior to their referral to the full GAMC. The Sub-Committee meets in a similar timescale to GAMC. The Secretariat for GAMC is provided by the Treasury. Each year, agencies are required to submit to NSW Treasury an integrated set of five TAM plans which comprise an Asset Strategy driving the following related plans; a Capital Investment Strategic Plan, a Maintenance Strategic Plan, an Asset Disposal Strategic Plan, and an Office Accommodation Strategic Plan.

The above Asset Strategy and Strategic Plans are to be consistent with the Guidelines outlined in the published TAM Manual and the process has been incorporated into the annual Budget allocation process. The Treasury considers an agency's RSP (or SBI) incomplete unless it is supported by the Asset Strategy and its supporting Plans.

Queensland Government

The challenge for Queensland Government is to ensure that community expectations for services are matched with an efficient use of limited resources. Government is also required to maintain a high level of essential services to the community and, at the same time, be responsive to the changing social, political and economic environment. This has led to an increasing emphasis on identifying and understanding the core business of government and its agencies.

In response, the Public Works Department of Queensland Government develops a range of asset management policies, guidelines, systems and support tools to assist Queensland Government departments deliver enhanced services to the community through better management of assets. The Department also provides advice to the Queensland Government and its departments on a range of asset management issues affecting the life cycle management of buildings, including capital investment planning, building procurement, tendering and selection of contractors and consultants, maintenance and disposal of building assets.

These products and services ensure that the Queensland Government and its departments are better informed on how to best manage the State's asset portfolio, worth billions of dollars (DPW 2003).

Strategic Asset Management guidelines have been developed for use by Government departments and agencies. Strategic asset management underpins all activities related to managing physical assets for optimal outcomes. The Strategic Asset Management Guidelines provide a best practice framework for implementing strategic asset management. They document the responsibilities of public sector asset owners, users and managers, and provide information and direction on all aspects of physical assets throughout their Lifecycle

The guidelines requires agencies through effective planning to identify the assets required to deliver their outputs cost effectively. Under this framework assets are classified as inputs to service delivery and agencies will need to know the full cost of holding assets to determine the true output cost of services being delivered. The guideline maintained that “The asset base in Queensland is generally sound however, it will not keep pace with future demand unless a strong framework is in place to ensure assets are effectively managed” (DPW 2003).

The guideline further noted the increasing need for a forward-looking approach to asset management that will lead to:

- structured and accountable corporate planning;
- demonstrable linkages between service delivery and resource planning;
- formal capital, maintenance and disposal planning for assets;
- the use of appropriate methodologies to manage the demand for new assets;
- more effective and innovative ways of delivering services;
- private sector participation in the financing, provision, management and maintenance of public infrastructure;
- enhanced coordination of public assets and infrastructure from a whole-of-government perspective. (DPW 2003).

Institute of Public Works Engineering Australia (IPWA)

The Institute of Public Works Engineering Australia and New Zealand National Asset Management Steering (NAMS) Group have jointly developed an International Infrastructure Management Manual (IIMM 2000). The manual defines asset

Management, introduces the concept of total asset management (asset management as an integral part of all organizations' activities) and life cycle asset management (decisions are made based on costs associated with all stages of an asset's life); shows the benefits provided by asset management techniques; outlines best practices; shows how to evaluate and implement information systems to support good asset management planning and decision making; cite case studies, and includes an implementation plan. The implementation section contains details of asset management standards, guidelines, techniques and references together with examples of key asset management activities such as:

- Developing and consulting on service levels,
- Demand forecasting and management
- Optimizing decision making
- Maintenance planning
- Risk management methods

The manual has an extensive glossary of terms related to asset management. In conclusion, the Australian approach to asset management is more holistic. The commonwealth, states and local Governments have developed robust asset management and improvement plans, techniques and strategies which should integrate well with other strategic planning processes. Asset management manuals have been developed which provides an overview of asset management principles, concepts and their application. The asset management concept was tied into Government agencies through accounting standards and public sector accounting systems, The Australian National Audit Office (ANAO) with a view to improving strategic approach and general asset management practices. Asset Management approaches have been better developed at State Government level, and examples have been provided of the close similarities in thinking adopted by some State Governments. States usually link the asset management process into their budgetary regimes.

2.7.3 Conclusions from the US and Australian Models of Property Asset Management

Asset Management models in the US and Australian has been developed from different drivers, but they are both developed with a view to ensuring effective and efficient performance of the physical assets. There are a number of similarities and differences that can inform development of a model of excellence:

The Asset Management models of both recognize the need for a central coordination committee to develop and disseminate best practice in asset management; for example, the FRPC in the US and the GAMC in the NSW State Government.

- Physical assets age and deteriorate leading to growing proportion of expenditure, and that pushed both countries to develop asset management approaches that bring about improved efficiency and effectiveness of physical assets.
- The US approach has been mandated by Presidential Executive Order, the US and Australian models link the property asset management planning process into budgetary cycles.
- Both countries have produced best practice guidance centrally; States Governments in Australia have also developed their own approach and a review of three of these (New South Wales, Victoria and Queensland) indicates close similarities and consistency of approaches.
- The US model has set out the requirement that a named individual at strategic level in all major agencies should be held responsible for property asset management.
- The ANAO has conducted a number of formal audits of the embedding of asset management and property asset management in central government departments and agencies.
- The Australian model involves the development and maintenance of whole-of-government asset management framework, based on life cycle costs
- The Australian Model, particularly the state levels, have established principles and guidelines which emphasizes
 - service delivery needs;
 - life cycle approach to asset management;
 - integrated approach to asset management and service delivery; and
 - increased emphasis for accountability for asset investment
- Both countries have recognized the strategic importance of managing assets and property assets as an important national and State resource. The next section looks at Asset Management practices in the UK.

2.7.4 Asset Management in the UK

In the United Kingdom (UK), the leading asset management practices have come from the water industry which operates in a privatized (since 1989) but heavily regulated environment.

Water companies are required to develop strategic asset management and business plans (which outlines the investments required to meet service obligations) and submit these to the Office of the Water Regulation (OFWAT) for audit purposes. This requirement has driven water companies to develop robust business cases for future expenditure and led to the development a more comprehensive asset management approach.

Asset management has been generally recognised in the UK as a key part of business planning which connects at strategic level, decisions about an organisation's business needs, the deployment of its assets, and its future investment needs. Accordingly, a number of holistic approaches to asset management have been developed. These among others, include the Lyons and Male reports on property asset management, the PAS 55 and RICS & ODPM Guidance on Asset Management 2005.

2.7.4.1 Property Asset Management

Public services in UK are evolving in the context of rising public expectation, increasing focus on improving efficiency and value for money, and the continuous emergence of new technologies. An asset base worth around £220 billion across central government underpins these services and needs to develop to reflect and support their evolution (OGC 2006). The Government's strategy for increasing efficiency in the public sector gives further impetus to these developments. Asset management is a key part of this story:

- selling surplus assets to free resources for new investment;
- transferring ownership of assets to the private sector where this secures access to new funding and skills, or by placing risk where it can be better managed;
- identifying and capitalizing hidden assets; and;
- increasing value for money from retained assets and property

Experts were also commissioned to undertake various studies and make recommendations for the optimum utilization of public assets.

Sir Michael Lyons Report

In 2004, Sir Michael Lyons published his report: *Towards the Better Management of Public Assets*. The reports investigated how the management of public sector assets could be improved and contribute to the Government's objectives of achieving further efficiency savings. It focused on the need for government to pay more attention to its assets and to ensure that its investments provided an effective and efficient rate of return in terms of value for money. Lyons concluded that the targets set in his report are achievable by 2010, if effective asset management strategies were put in place by the central civil government.

Whilst Lyone's report considered the wider definition of assets (roads, infrastructure and intangible assets) there was an emphasis on property assets, whose portfolio management represents a considerable proportion of an organization's outgoings, often second only to staff payroll. Property held either as freehold, leasehold or through PFI, is a major investment. In order for a return to be realized, investment in property is not often a short-term term decision. Acquiring property is a major decision and disposal is often a time-consuming process. Lease terms may be reducing in length, and the inclusion of break options in lease terms may be increasing, but such flexibility comes at a cost. After all, landlords need to generate a return from their own investments too. (Lyons 2004)

By raising the profile of property assets Sir Michael has ensured that asset management becomes a key contributor to business thinking. Disposal targets aside, good asset management contributes to the ongoing effective management of an organization's business. Good asset management means challenging the status quo in order to seek better ways of doing things.

In response to the recommendations in Sir Michael Lyons' report to the Chancellor, OGC has responsibility for embedding effective property asset management in central civil government within the HM Treasury initiative to improve asset management

across the wider public sector. To support this role therefore, OGC engaged Professor Steven Male, of Leeds University, to undertake a study into the current state of property asset management in Central Civil Government. The research has provided:

- a baseline assessment of the current status and practice of property asset management in central civil government
- a model for excellence in property asset management practice with a range of practical examples including development of a maturity matrix
- an assessment of the potential for efficiency gains and the interventions required to achieve them

The Leeds University recommendations have been based on evidence drawn from:

- international literature on best practice
- US and Australian government models
- an extensive review of existing processes in government that impact on asset management
- questionnaire responses from Heads of Estates across departments, agencies and NDPBs
- in depth follow-up interviews
- a 2 day workshop held in February 2006 including: OGC, HMT, NAO and departments
- shared information on ongoing work within government, in particular the property performance benchmarking study, an OGC Property Asset Management Skills study and the NAO report *Getting the best from public sector office accommodation*.

The research identified wide-ranging issues that impact on the effectiveness of property asset management, the ability to achieve efficiency savings and to release capital. Wider benefits were also identified. These relate to improved alignment of the asset base to the delivery of government services, together with improvements in governance and accountability for the asset base (OGC 2006).

Recommendations encompassed a number of areas and further analysis of these has identified four emerging themes:

- The fragmented nature of ownership and responsibility for the civil estate allied to a lack of strategic direction.
- A lack of standards for asset management planning, capability requirements and aspirations for delivery of property solutions.
- A lack of understanding of the property asset management function and the capability required in government, particularly at the strategic level.
- A lack of review, audit and challenge mechanisms.

A property asset management matrix of maturity has been developed as part of the research to enable Government organizations to establish how well they are conducting PAM. It also provides organizations with an indication as to the requirements for excellence in PAM. The matrix consists of a set of enablers against which an organization can judge itself.

The Maturity Matrix defines levels of organizational maturity and capability across all aspects of Property Asset Management (PAM). It has been developed to underpin the Skills and Capability Component of High Performing Property (HPP) and to support delivery of a rationalized effective central government estate by 2012. It is a profiling tool for understanding the total requirement for PAM capability regardless of whether provision is in-house or through private sector partners. Application of the Matrix recognizes that a range of factors impact on the required levels of capability

Although the Matrix has been developed for buildings and office accommodation it applies equally to specialist and infrastructure assets and there is an increasing expectation of wider application. The Matrix is primarily to be used in self-assessment and self-development but it can also be used in a PAM audit (Male, et al, 2006). Using this matrix in assessing the organizational capability in PAM gives the following benefits:

- An evidence based assessment of the existing organizational capability across all the enabling aspects of PAM
- A well founded evaluation of the areas of shortfall in PAM capability enabling assessment of changes required in any aspect of PAM

- Insight into the activities required to support PAM and thus an appraisal of the action required under HPP in terms of time, resource and cost
- A defined methodology that underpins the justification for agreeing a capability Transition Strategy
- Assurance of availability of capability in line with delegated responsibility and accountability, and
- Assurance of capability to comply with PAM regulatory, propriety, value for money, and management of property related risk.

2.7.4.2 PAS 55

PAS (Publicly Available Specification) 55 aims to make sure that an organization's assets are effectively managed over time. By providing guidance and structure through an independently audited and externally recognized process, the specification allows organizations to ensure good stewardship of their physical infrastructure.

By clarifying and defining what asset management is (and isn't), the specification allows organizations to develop good practices for the sustainable, long-term administration of their assets, thereby demonstrating that assets deliver the required level of performance of a service or product at an optimal cost.

The Publicly Available Specification (PAS), according to John Woodhouse (2006), has been developed in response to demand from industry for a standard for carrying out asset management. It is applicable to any organization where physical assets are a key or critical factor in achieving effective service delivery. PAS 55 covers the management of physical infrastructure assets, particularly those that form elements in our built environment – such as utility networks, power stations, railway systems, oil and gas installations, manufacturing and process plant, buildings, airports, etc (PAS 55-1 2003). It is currently published in two parts:

- PAS 55-1 Part 1 – The Specification (released in 2004 – contains 21 requirements)
- PAS 55-2 Part 2 – Guidelines for the Application PAS 55-1

PAS 55 has been developed in consultation with a large number of major organizations and individuals that are active and proficient in the field of asset management. IAM is organizing body responsible for development of PAS 55 and it has been prepared and published by BSI. It is likely to be adopted as a British Standard in due course with eventual adoption as an ISO standard.

The PAS also covers asset management from an organizational perspective – applying to cases where the organization’s ability to deliver services or products is dependent on the function and level of performance of its assets. The scope of the PAS is limited to the physical asset, but the PAS recognizes four other broad categories of asset that must be managed to achieve organization’s strategic plan, these being: human assets, information assets, intangible assets (reputation etc) and financial assets (PAS 55-2, 2004)

Definitions

PAS 55 provides definitions of many terms, including:

Asset Management which is defined as: “systematic and coordinated activities and practices through which an organization optimally manages its assets, and their associated performance, risk and expenditures over their lifecycle for the purpose of achieving its organizational strategic plan”.

Assets are “plant, machinery, property, buildings, vehicles and other items and related systems that have a distinct and quantifiable business function or service”.

Note that this definition reflects the scope of the PAS.

Critical Assets: “Assets (or subset components thereof) that are identified as being critical (now or in the future) to achieving the asset management policy, strategy and objective”

Lifecycle: “Time interval that commences with the identification of the need for an asset and terminates with the decommissioning of the asset or any liabilities thereafter”

PAS 55 stresses the relationship between the asset management system, the organizational strategic plan and stakeholders, continual improvement through

monitoring performance of processes and assets and asset condition, and feedback to the organizational strategic plan and the stakeholder's expectations.

2.7.4.3 Asset Management in UK Local Government

Introduction

With the introduction of the prudential capital regime, pressure on revenue budgets to fund capital infrastructure investment is a permanent management issue for Local authorities in UK. They are therefore searching for new and better ways to deliver services to meet their financial and service needs.

Authorities are under direct pressure to improve the school estate, social housing provision and the condition of local roads, and evidence of good asset management may become a condition of discretionary grants. Good asset management can also help the authority contribute to the achievement of sustainable development, which is part of its obligations under Best Value. These prompted the development of strategies that ensures improvements in utilization of public assets.

RICS & ODPM Guidance on Asset Management

In 1998 the Audit Commission published a report on local authority property management, which recommended that councils give greater attention to the strategic and policy implications of property ownership and use. In 2000 the Commission published *Hot Property – Getting the Best from Local Authority Assets*, which recommended that councils review the need to retain property assets, especially those that ‘... do not contribute to service objectives’. This report includes several examples of best practice in local authority asset management (Audit Commission 2006).

In 2004 the Office of the Deputy Prime Minister (ODPM) commissioned the Royal Institute of Chartered Surveyors (RICS) to produce guidance for local authorities on producing asset management plans. The guidance (RICS, 2005), seeks to make stronger links between property management and effective service delivery. It provided the necessary guide on how local authorities can use good property asset

management techniques as a vital tool to help them meet their corporate and service objectives. The guidance serves a number of aims:

1. ODPM wants local authorities to have access to information on how to use asset management techniques effectively
2. Best practice guidance shows local authorities how they can use those techniques to improve services, make operations more efficient and increase cost effectiveness
3. RICS promotes high standards of property management throughout the public sector.

By adopting the best practice set out in the guidance, Local Authority can gain the maximum benefit from its assets – efficiency savings, better services and modernized working. The ODPM/RICS guidelines address these issues. They give Local Authorities the tools needed to ensure that their authorities' property assets can be properly managed so that property management is configured to drive the delivery of service and corporate goals.

One of the important issues in the guideline is the position that because asset management planning has implications across the authority, it is imperative that all the stakeholders have an opportunity to contribute to and influence the development of the plan. To achieve this, lead members should ensure that they actively contribute to the development of the plan, and that they are seen to be doing so. Asset managers should ensure that they identify all of the stakeholders who need to be involved in the asset management process, while service managers should not only participate in the process, but they should also ensure that they include all of the stakeholders within their departments. Local authorities should also seek to learn from other authorities and other organizations to see what they can learn from the experiences of others.

Conclusion from the UK approach

The UK, like the USA, Australia and New Zealand has recognized that Asset management provides a challenge to the way things are done and looks for options to improve delivery. Accordingly, robust and holistic approach to asset management has been developed to ensure that where assets are retained they need to be measured to

ensure that they are delivering effectively; where they are inadequate they need to be replaced; where they no longer meet the business need they must be disposed of. Recognising opportunities for embedding the thinking processes that lie behind this approach has been focus of the various approaches developed.

The clear conclusion is that property assets are an important strategic resource which need to be managed accordingly. A number of central and other initiatives that will have an impact on property asset management have been identified. For example, the OGC Efficiency Programme, including the Relocation initiative, the Property Benchmarking initiative, and, the Sustainable Development initiative, all of which impact Property Asset Management.

PAS 55 is a useful framework against which organizations can structure and review their asset management activities. Independent assessment against this framework is a means of providing assurance both internally and to external stakeholders that corporate risk issues are being tackled properly and that the organization is controlling its asset base from a position of knowledge. PAS 55 is applicable to any organization that depends upon its physical assets for the performance and continuance of its business operations.

The Local Government Asset Management Guidance impacts on all areas of management, operation and delivery of property assets and the associated governance frameworks. It indicates that successful asset management can bring significant improvements in service delivery. It provides a brief understanding of how local authority asset management can make a difference.

2.8 Best Practice in Asset Management

Best Practices are those specific business processes that work for one organization and create ideas, options and insights for other organization. Best Practices are methods, processes, or practices about which one of the following pertains (GSA 2005):

- It produces superior results;
- It leads to exceptional performance ;

- It is recognized by an industry expert;
- It is deemed so by an organization's customer;
- It is clearly a new or innovative use of personnel, resources or technology.

In a report to the OGC on improving asset management in Government Department, Howarth (2006) observed that the best practice asset management relies on the integration of the following:

- Knowledge/understanding/experience of how assets contribute to business planning, such as acquisitions, disposals, workplace strategies, refurbishments, benchmarking, etc
- Experience of developing a business strategy which meets the delivery requirements of the organization and takes into account all resource impacts: (staffing), asset-base (property) and economic (funding)
- A thorough understanding of the economic tools for ensuring that the right financial decisions are taken, such as business case preparations and option appraisal, whole life costing and performance measurements

And the IAM manual states that best practice AM is the implementation of advanced AM techniques. To achieve best practice in asset management therefore, an organization must be able to demonstrate (IAM 2002):

- Knowledge of Assets owned.
- Knowledge of the physical condition of the assets.
- Knowledge of the levels of service required by customers.
- Knowledge of asset performance and reliability.
- Knowledge of asset utilization and capacity.
- Knowledge of asset value.
- Ability to predict future demands for service.
- Ability to predict failure modes and estimated time of failure for assets.
- Ability to determine the likelihood and consequences (risk) of different failure modes.
- Ability to analyze alternative treatment options.
- Ability to prioritize treatment options based on risk.
- Ability to optimize maintenance and operation activities.
- Ability to prepare an asset management plan demonstrating the above.

The above attributes identified by the IAM manual break down essentially into two major groupings:

- Knowledge of the physical asset base at a strategic and tactical level
- Organizational Capabilities in asset management at a strategic and tactical level.

The IAM Manual however contends that best practice is not always the appropriate practice. Setting the right level of asset management practices is part of a needs analysis process, taking into account such factors as legal requirements, customer expectations, nature of assets, risk exposure and availability of resources.

Basic and Advanced Asset management

The degree of complexity of asset management will differ according to an organization's corporate needs. The Institute for Asset Management has identified two generic types of Asset Management organization, the *basic* and *advanced* organization; providing important parameters for deciding the scale of change required in moving towards organizational excellence in Asset Management. Initially, plans are often developed at a level designed to provide basic technical management outputs such as forward programmes and associated financial projections. This is referred to as the 'basic' approach defined by IAM (2002) as one which:

- Takes a life cycle approach.
- Develops basic asset management plans covering:
 - The using of the best current information and random condition/performance sampling.
 - Determining existing levels of service.
 - Contrasting existing management strategies with opportunities for improvement.
 - Calculating long term (10 – 20 year) cash flow predictions for asset maintenance, rehabilitation and replacement based on local knowledge of assets and options for meeting current levels of service.
 - Developing initial plans which are relatively simple but address the key areas identified above and intend to be improved subsequently.

After the development of the initial AM plan, the sophistication of AM should improve incrementally to an optimum level, appropriate to needs of the particular organization also as more information become available or improved system and processes are in place. An 'advanced' asset management approach seeks to optimize activities and programmes through the collection and analysis of detailed information about asset condition, performance, life-cycle costs and management options, before providing the required level of service at least cost. It entails (IAM 2002):

- Using predictive modeling, risk management and optimized decision making.
- Having well defined and agreed levels of service.
- Using accurate and detailed asset data with associated high levels of confidence.
- Understanding the impact of other tactical plans on the corporate Asset Management plan.
- Undertaking reviews that confirm the technical logic and appropriate implementation to meet community and other key stakeholder needs and strategic objectives.

More advanced AM practices and systems will be justified for assets with the following characteristics:

- High value (i.e. AM decisions can have high financial impact)
- Advanced age/deteriorating condition
- Complexity in terms of number and variety of asset components

Higher levels of risks exposure will lead to more advanced AM techniques. Exposure to risk in terms of impact of asset failure on business performance, the level of service and public image of service provider should always be assessed. Advanced AM will also require greater level of financial resources and staff input than a basic approach. In developing AM objectives therefore, the benefits and costs, AM options, and availability of resources must be considered (IAM 2002). The value, complexity and consequences of asset failure are factors in deciding what level of asset management techniques are required.

2.9 Asset Management Process

In simple terms, there are four main steps in what might be described as Asset Management Process. These are:

- Identifying objectives
- Preparing an asset management plan
- Implementing the plan and its programmes
- Auditing and review.

Australian New South Wales and Queensland States had developed Total Asset Management (TAM) and Strategic Asset management (SAM) policies respectively. The aim is to provide better planning and management framework in respect of government assets, by the most efficient means and within the resource limits of the community. The policies outlined a number of strategies aimed at improving efficiency, effectiveness and value for money. The policies, which underpins all activities related to managing physical assets for optimum outcomes, requires organizations, through effective planning, to identify the assets required to deliver their outputs cost effectively. Under these frameworks, assets are classified as inputs to service delivery and agencies will need to know the full cost of holding assets to determine the true output cost of services being delivered.

Asset management activities espoused by both TAM and SAM extend from the identification of user expectation to the daily operation of the assets required to meet defined levels of service. The activities and strategies that make up the Total Asset Management process are shown in Fig 2.3 and are divided into three phases: the strategic planning process, the operational planning process and the audit/review of the implementation of the asset plans (TAM 2000):

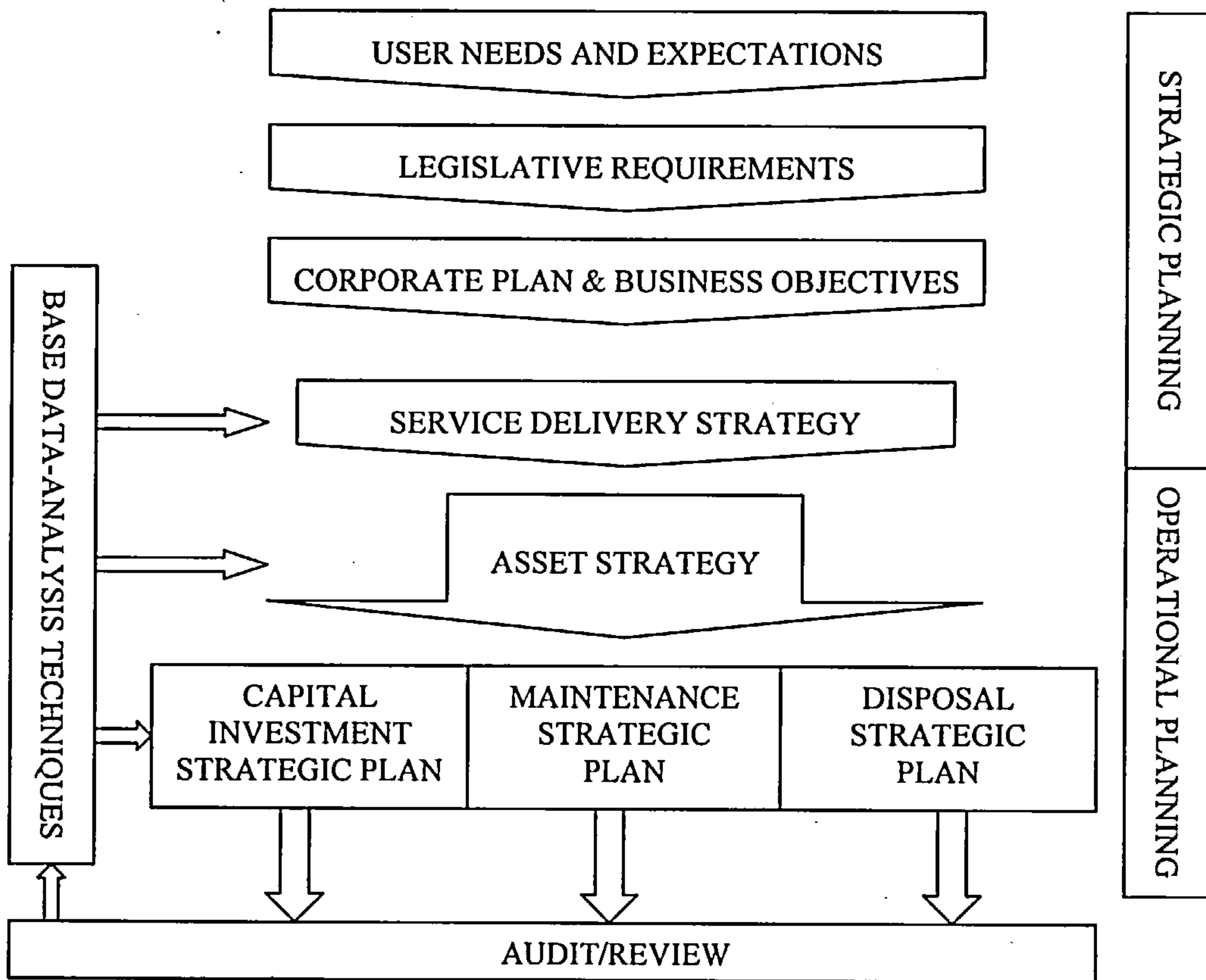


Fig 2.3 Total Asset Management Process Source DPW (2003)

The basic principles, activities and strategies that make up the TAM and SAM asset management processes as well as the tools that managers use, are basically; Strategic Planning; Operational Planning and Audit/Review. These are therefore discussed in the subsequent sections.

2.9.1 Identifying Objectives

The Asset Management development process should begin with the organization setting broad corporate AM goals and objectives and move logically through the following steps (IAM 2002):

- Confirm AM overview structure and responsibilities
- Assess current status/future requirements for AM and confirm an improvement programme and resources required

- Prepare suitable AM plans based on desired (or existing) levels of service based on known or assessed customer requirements
- Maintain two-way information flows between AM plans and other organizational plans, seeking ways to improve the effectiveness of AM plans outputs
- Monitor, review and audit the AM plan

Specific objectives should be developed for the management of assets which satisfy the broader corporate objectives. AM objectives should be able to be understood easily and relate to the quality, coverage, timeliness and cost of AM outputs. Specific objectives according to the IAM manual should relate to:

- Establishment of AM team and/or coordinator
- Completion of needs analysis and improvement plans
- Undertaking service level review
- Preparation of AM plans
- Implementation of plans for AM systems, data and processes
- AM audit and review

Meaningful performance measures will be required in order to monitor progress (IAM 2002).

2.9.2 Service Delivery Strategy

An organisation's Service Delivery Strategy defines what services it will deliver in accordance with their Corporate Plans thus satisfying its stakeholders while providing community benefits. It translates the broad goals and objectives into specific service requirements that it plans to deliver outlining the strategy that is to be adopted. It should (NSWT 2004):

- define the scope, standard and level of services to be provided;
- utilise the techniques of demand management, economic appraisal, value management and risk management in evaluating service delivery options;
- look at future service configurations and considering mid to long term issues which will have an impact on service demand and supply;
- assess the methods of service delivery and the resources needed, including requirements for the use of assets to achieve the most efficient and effective delivery of services.

2.9.3 Asset Management Strategic Planning

There have been developments in the management of assets, not the least of which is introduction of the strategic asset management as a set of principles which is meant to guide or focus senior management on the disciplines required to manage assets for the most efficient and effective outcomes. Queensland's DPW (2004) define strategic asset management as the process of developing management strategies that will:

- contribute to the best utilisation of assets in the delivery of services to the community in line with corporate plans and service delivery strategies
- ensure ongoing compatibility between the composition of an asset portfolio and the changing environment within which it operates.

The objective of asset strategic planning is to ensure that strategies implemented in managing an asset portfolio are focused on providing efficient and cost-effective services in line with corporate planning and service delivery strategies. The process represents the translation of the demands and/or expectations of users/customers of an organisation into service needs through the preparation of long-term strategies while conforming to legislative requirement in order to determine the optimum operational activities for the business DPW (2004)

The IAM Manual has developed an advanced framework that take a holistic view of Asset Management which assesses the need for, and the roles and objectives of the management of all assets, that will ensure needs and benefits are optimized. As shown in the flowchart below (Figure 2.4), there is the opportunity to feed all information, customer and legislative expectations and requirements and decisions throughout an organization. Such a framework ensures that a management decision-making group or delegated individual accepts responsibility for the programme. Their responsibility should be to a member of the organizations corporate team. An asset management programme is likely to fail unless there is a commitment from the staff and strong corporate support. (Styles 2000).

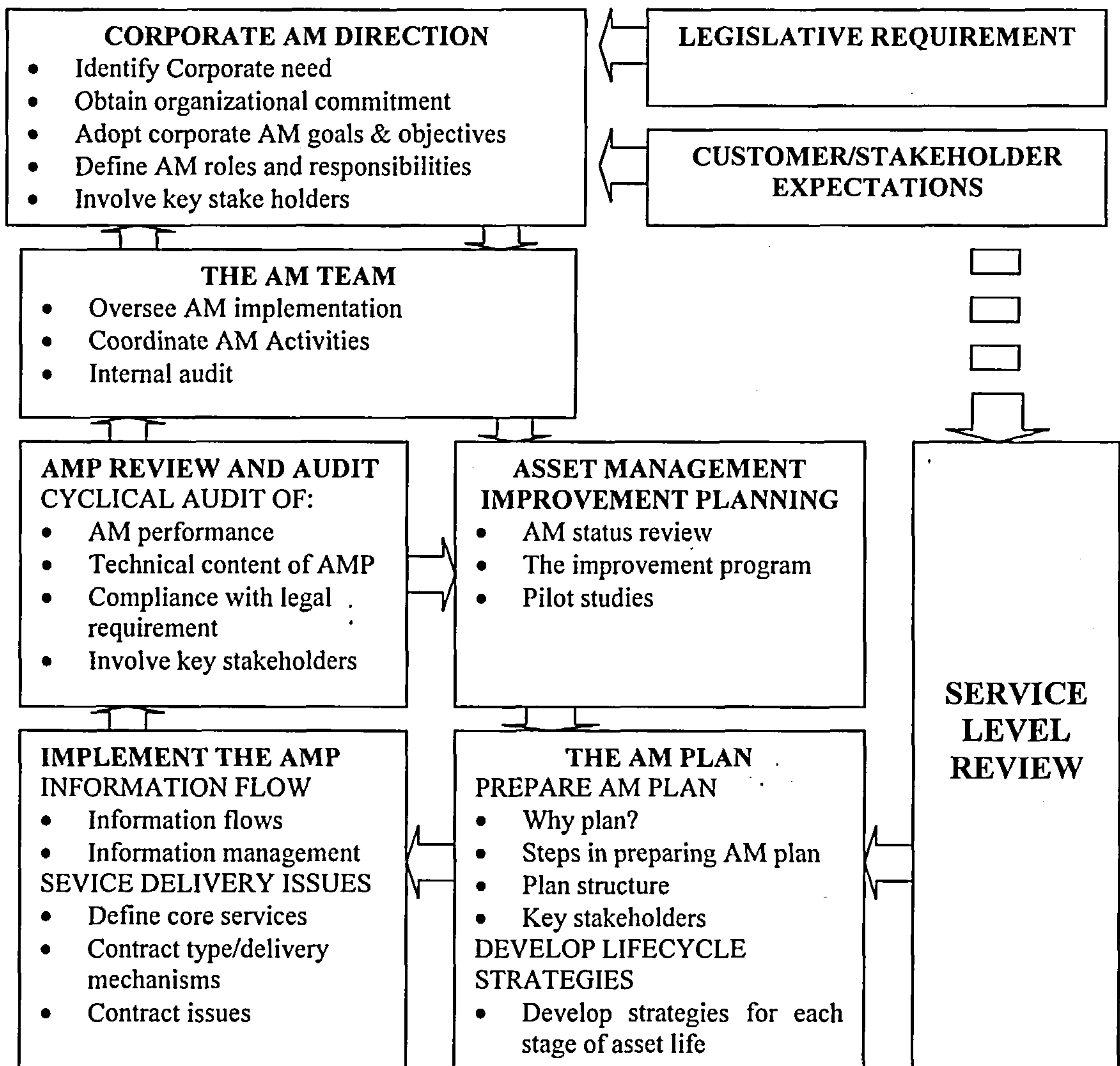


Fig 2.4 Flow Chart for Developing and Using Asset Management Plans, Source: International Infrastructure Asset Management Manual (2006)

Key components of the strategic planning process are (NSWT 2004):

- The development of a mission statement which describes the long-term desired position of the organisation.
- A review of the operating environment, to ensure that all elements that affect the organisation's activities have been considered.
- Identification of strategic options to achieve strategic goals arising from the mission statement.
- A clear statement of strategic direction, goals and desired outcomes.

The development of asset strategies through analysis and direction-setting process provides a basis for compiling asset strategic plans, and disposal, capital, maintenance and management-in-use programs formalized through an annual budget process. The objective of planning, according to the SAM policy, is to ensure that strategies implemented in managing an asset portfolio are focused in providing effective and cost-efficient services in line with corporate planning and service delivery strategies.

The greatest savings and most enduring efficiencies are said to be achieved in the earliest planning phases of an asset life. It is also observed that more effective planning and understanding of the various service delivery options always leads to large savings. Sometimes asset related costs can be avoided if non asset solutions are found.

Benefits of Strategic Asset Planning

The implementation of effective management strategies will promote the best utilization of assets in the delivery of services to the community in line with corporate plans and service delivery strategies. Benefits to be gained include (DPW 2004):

- forecasting budget requirements
- determining future asset requirements to allow for forward planning
- identifying changes in asset requirements to facilitate formulation of the following
 - Capital Investment Plan (e.g. the need for a new facility)
 - Maintenance Plan (e.g. implement essential maintenance only, pending sale)
 - Management-in-use Plan (e.g. review tenancy layout to improve functionality)
 - Disposal Plan (e.g. declare surplus, and include in sale program)
- providing a basis for the preparation of an annual Capital Investment Strategic Plan
- assisting agencies in meeting the goals of the Government Financial Management

2.9.4 Operational Planning

The Operational Planning process, or Asset Management Framework, translates the service delivery strategy into specific action plans for managing an organisation's

assets so as to cost-effectively achieve the organisation strategic goals in the long-term. The TAM operational planning process consists of the development of four components that are interconnected with each other. These are (NSWT 2004):

- The Asset Strategy *and its integrated*
 - The Capital investment Strategic Plan
 - The Asset Maintenance Strategic Plan
 - The Asset Disposal Strategic Plan

Asset Strategy

Asset Strategy is “the planned alignment of physical assets with service demand” (DPW 2004). It is achieved by the systematic management of all decision-making processes taken throughout the life of the physical asset (DPW 2004). The strategy enables organizations to focus on service delivery requirements of the assets rather than on the assets themselves, it also enables organizations to establish the asset portfolio that is most appropriate, effective and efficient in meeting the demands of their service delivery requirement. The development of Asset Strategy is described by the NSW TAM policy as the critical stage in agency strategic planning. It is seen as a vehicle by which an agency matches its asset portfolio to its service delivery requirements.

The strategy is the top-level plan in the TAM process which establishes the basic relationships between Service Delivery Strategy and the Capital Investment, Asset Disposal and Office Accommodation Strategic plans with how these plans inter-relate. The plan outlines and guides the organization’s asset response to its service requirements, through the development of an asset portfolio, risk management strategies and asset performance measures. The strategy identifies any needs or ‘gaps’ to support services and addresses those through planned capital investment, disposal or maintenance including replacement and/or upgrading. In doing so, the Asset Strategy (NSWT 2004):

- demonstrates how the organisation’s asset portfolio supports its service delivery;
- develops an asset portfolio to support service delivery;
- sets priorities for the assets to be managed;
- develops gap analysis between the existing and required assets;

- identifies asset-related risks which affect delivered services;
- identifies asset performance levels required to achieve service performance established in the RSP;
- addresses risk and compliance with mandatory requirements such as Occupational Health and Safety or asset standards; and
- defines the relationships between the RSP, the Corporate Plan; and
- Provides information for Capital Investment, Asset Maintenance, Asset Disposal and Office Accommodation Strategies.

Asset Strategy Development Framework

In preparing an asset strategy, Stewart (1999) observed that it is necessary to:

- prepare an inventory of assets, including details such as the date of construction/refurbishment, floor area, category of use, type of construction, etc
- confirm the level of service required by building users and the cost they are prepared to pay for that level of service
- develop a long term plan, including annual maintenance costs and estimated dates and costs of future refurbishments and replacements
- identify and assess areas of risk and develop strategies and costs to mitigate those risks
- explore the best methods of delivering the asset management strategy, using in-house resources, external resources or both, and how best to procure these services
- set key performance objectives to enable the performance of your assets to be measured
- determine how funding required for these programmes will affect the organisation's performance.

And the key phases in developing asset strategy according to TAM policy includes;

- Service requirements
- Asset portfolio
- Risk and risk management
- Asset performance management

Service Delivery Requirements

The primary focus of Strategic Asset Management according to TAM 2000, is to achieve optimal service delivery through effective asset solutions and efficient asset management. Traditional performance has been measured in terms of inputs and the minimization of waste at the input end of the resource equation. Strategic Asset Management requires an organization to focus on outcomes and the output end of the resource equation. The real measure of success is enhanced service delivery. Performance measures and benchmarks in Strategic Asset Management plans should therefore be primarily directed at measuring these outcomes.

An Organisation's service delivery information as contained in the corporate planning documents should provide necessary details about which services are to be delivered. In addition to that, the following questions should be answered to ensure that the Asset Strategy is developed in response to more specific service needs (NSWT 2004):

- What services does the organization plan to deliver?
- To whom are the services to be delivered and what are the stakeholders' expectations?
- When are the services required to be delivered?
- Where are the services to be delivered; and
- To what level/standard are services to be delivered?

Developing an Asset Portfolio

The asset portfolio developed by the organization should represent the asset response to its service requirements. It is derived from analysing the services delivery requirements and other organisation's corporate planning documents. The process of developing an asset portfolio should be undertaken in the context of overall resource management and service delivery.

Identify asset-related risks which may affect delivery of services and achievement of results

A risk is the chance of something happening that will have an impact upon results. Risk management is the culture, processes and structures that are directed towards effective management of potential opportunities and adverse effects. The management of risk is beneficial because it contributes to more economic service delivery, opportunities to reduce uncertainty and costs, and more effective contingency

planning. Asset-related risks may include those that directly affect the assets during their useful life or which have an impact on the level of demand for services. When assessing asset-related risk to delivery of services agencies should adopt a whole of life approach as the risk exposure varies during the asset life-cycle (NSWT 2004).

The Australian TAM 2000 states that asset management requires identifying, analysing and evaluating risks associated with the acquisition, operation, maintenance and disposal of assets. Potential asset-related risks are numerous and may include:

1. Risk directly affecting assets during their useful life, such as:

- Inadequate maintenance;
- Capability;
- Equipment breakdowns; and
- Industrial action; and

2. Risks which have an impact on the level of demand for service, such as:

- Stakeholder expectations;
- Technological change;
- Demand trends;
- Population growth; and
- Environmental events.

Asset Performance Measures

Asset performance measures are essential to the development and implementation of an Asset Strategy as they provide a gauge of how well the management of assets is supporting services. There are two groups of asset performance measures that must be identified and applied in the Asset Strategy. They are equally important and focus on two distinct aspects of asset management (NSWT 2004): Effectiveness measures and efficiency measures.

Efficiency measures show how the cost of assets affects the cost of services. They demonstrate whether value-for-money service delivery is being achieved. They may also show whether the assets are being managed within the budgetary and industry standards for similar assets. Effectiveness performance measures provide the most objective method of determining how successfully assets have been used in supporting services. It helps to identify asset-related risks and establish service focussed priorities.

Performance measurement also involves assessing the adequacy of a process or result, in qualitative or quantitative terms. The inclusion of a comprehensive set of qualitative and quantitative measures demonstrates the organization's knowledge of its asset portfolio and that it understands its greater role in maximising the use of available resources.

Qualitative measures may include (DPW 2004):

- establishing that strategies contributed significantly to the achievement of objectives outlined in corporate plans and service delivery strategies
- gaining acknowledgement that the process of consultation with key stakeholders (such as resource and service delivery planners) resulted in due consideration being given to their asset related needs.
- having the asset strategies reflected in the following plans:
 - Capital Investment Plan
 - Management-in-Use Plan
 - Maintenance Plan
 - Disposal Plan

2.9.5 Implementation Plan

Implementation of efficient and effective asset management requires a clear understanding of the responsibilities of ownership. The outcome includes comprehensive plans for facilities management, capital investment, management and maintenance of existing assets, and disposal or adaptation for a new use of surplus assets. The University of Griffith (Griffith 2004) Strategic asset Management Plan states that the implementation plans must demonstrate strategies that yield the following benefits:

- a clear understanding of the role that assets play in support of the institution's objectives
- alignment of assets with service delivery strategies
- the provision of an environment that supports service delivery
- the optimal functionality and utilization of assets
- the development of assets which are environmentally sustainable in design and operation
- management efficiencies and effectiveness
- maximum return on investment
- appropriate workplace health and safety management
- rapid identification and reporting of surplus or under-utilized assets

- access to accurate data and information
- maximum benefit from the application of capital and maintenance funds
- the identification and quantification of opportunities and risks.

After having detailed knowledge of the organization's asset base, including locations, functions, physical attributes, and condition, the gap between the existing and the required asset capacity is then developed into capital investment, asset maintenance and asset disposal options, which are discussed in the subsequent sections.

Capital Investment Strategy

A capital Investment Strategic plan seeks to provide efficient and effective planning of organization's capital resources by making sure that there are clear and detailed links between assets and the service delivery outcomes they maintain. It involves assessment of all investment options to meet service delivery requirements using laid down processes.

The Capital Investment Strategic Plan (CISP), according to the NSW TAM guidelines, applies where the Asset Strategy indicates investment may be needed in new assets or significant improvements or upgrading of existing assets. Development of the CISP relies on a robust Asset Strategy and involves (DPWS 2001):

- Developing a Project Brief, which translates service delivery needs into specific and detailed project objectives
- Generating options which satisfy the Brief, including ensuring that alternatives to capital project procurement have been considered.
- Evaluating and comparing options, by using assessment and decision tools accompanying the TAM Guidelines.

The essence of Capital Investment Planning is to assess all investment options to meet service delivery requirements including purchase, lease, service contract, and non-asset solutions together with all the required outcomes.

By recognizing that built assets are only platforms for delivery of services, new investment strategies should be implemented only if they directly support new or improved service delivery outcomes. SAM policy requires that a structured process be

followed, through which the need for new investment can be demonstrated. In all cases where it is necessary to proceed with the delivery of new investment, the full life cost and function of the potential investment should be considered, with this information being used to shape the new investment solution.

Asset Maintenance Strategic Plan

The Asset Maintenance Strategic Plan is meant to practically manage the threat of the inability of assets to support service delivery strategies, with a view to yielding a more productive and reliable asset portfolio within the limits of available resources. The plan defines maintenance standards, describes how the work is to be carried out, and forecast the necessary maintenance expenditure for the planning period (NSWT 2004).

Maintenance cost of assets are likely to continue to increase due to gradual aging of the assets, poor management of assets, and the changing expectations and technologies, which prompts the renewal or refurbishment of assets, even though they work adequately to provide the required level of service.

The Queensland Strategic Asset Management document describes Maintenance Strategic Planning as the “process that provides a strategic link between an agency’s maintenance program and its corporate directions and core business. The objectives of maintenance strategic planning are to ensure that assets continue to support the business objectives and service delivery requirements of the agency. Maintenance strategic planning allows an agency to plan and implement a maintenance program in alignment with its capital investment, operational and disposal plans” (DPW 2004).

The process of maintaining physical assets covers all actions necessary for:

- Retaining an asset in a specified condition
- Restoring an asset to a specified condition

It requires a properly structured and professionally managed system to achieve this in a cost-effective manner.

Asset Disposal Strategic Plan

Assets Disposal Strategic plan is an elaborate assessment of assets that the asset strategy designates as no longer satisfactorily meeting their services needs as required at the lowest long-term costs. This plan assists agencies to identify for disposal, all redundant assets that might otherwise reduce efficiency and effectiveness in service delivery.

Asset Disposal Planning “requires two separate but distinct elements: the detailed assessment of identified assets as ‘surplus’ by the Asset Strategy, followed by an analysis of the physical ‘disposal’ of the assets” (DPWS 2001). An asset is characterized as surplus when any of the following ensues:

- The asset is not required for the delivery of services, either currently, or over the longer planning frame
- The asset turns out to be too costly to maintain and/or operate
- The asset is inappropriate for service delivery

If an asset is considered a surplus, its physical disposal will then depend on one of the following:

- Whether there are net disposal benefits in financial or other terms
- Whether there are secondary service obligations that has to do with the asset, which necessitates its maintenance
- Whether a disposal can be carried out without affecting the physical environment negatively.

Strategies to dispose of surplus assets according to the Queensland’s SAM, will focus, firstly, on identifying those assets that no longer meets the service delivery needs of the agency, and secondly, on disposing of these assets in a structured and prioritized manner, in full knowledge of prevailing market conditions (DPW 2004).

Assets identified as being surplus to existing or anticipated requirements as part of the asset review and analysis process should be examined in detail to establish firstly, that there are no alternative economic or community uses of these assets, and if disposed of, that maximum return to government is achieved. Disposing of surplus assets, in accordance with a disposal plan, ensures that they do not become a maintenance

and/or financial burden. It may also free up funds required for capital works, influence decision-making and support the forward estimates and budget processes.

2.9.6 Audit/Review

The objective of auditing, according to TAM 2000, is to ensure the effective development, implementation and operation of asset management plans which is essential in order to establish a continuous assets management improvement cycle, maintain best industry practice and assess the quality of:

- Assets management processes, information systems and data
- Asset management plans

The implementation of asset management plans

It is essentially an assessment of the organisation's performance with regard to the management of its asset portfolio while critically reviewing the current level of service provided and possible areas of improvement.

Audits can be a very useful tool in asset management and the entire business process of an organisation but a certain culture has to be created in order to maximise its effectiveness. Audits have to be (NSWT 2004):

- Logically structured and repeatable as to enable a future review to monitor the progress or decline that has occurred.
- Carried out with a view to encouraging improvement, not blaming past performance.
- Structured in such way as to identify the greatest benefits for the organisation from a total "business" sense.
- Completed by a suitably qualified auditor specialising in this area of practice.

Benchmarking asset management activities will assist this process of measuring performance in order for the development and improvement of future asset management plans. This therefore leads to the discussion of asset management decision tools in the next section.

2.10 Assessment and Decision Tools

In developing the Asset Management strategies listed above, Asset Managers will be required to critically assess their organisation's operating environment and its competency to respond to that environment. They will need to make difficult decisions that have long-term and often critical consequences for their organization and/or its stakeholders.

NSW TAM policy has given a number guidelines and decision tools that will improve the accuracy of their assessments and the soundness of their decisions. Some of these include:

- Demand Management
- Value Management
- Risk Management
- Asset Information

This section therefore makes a brief discussion on each of the above tools. The details are mainly drawn from the Australian models, which has asset management processes.

2.10.1 Demand Management

In the past, Government's response to community demands for more or better services in order to raise their standard of living was to improve its capacity to supply, but this is no longer sustainable. The demand for service must now also be managed (DPW 2004).

Demand Management policies enable the interaction between supply of service and demand for assets. *Demand Management* is defined as: 'The active intervention in the market to influence the demand for services and the assets generated and/or used in supplying these services to best match available resources to real needs and ensuring the services provided are delivered with the best value for money.' (GAMC 2003). Successful Demand Management requires organizations to clearly understand that their corporate role is not to provide ever more services, but to provide:

- effective service outcomes to meet identified community needs
- assess if this need is changing and
- to respond appropriately and within the available resources.

Demand Management should be an essential part of the development of the Service Delivery Strategy, and its process requires asset managers to first understand both their clients and the true cost of providing services. They then identify demand as the needs of services, rather than wants of assets. Decisions as to which needs are satisfied are then made from a whole of organisation or government perspective.

According to the NSW TAM policy, demand motivates the supply of services and leads to the provision and use of resources including physical assets. When demands are satisfied by the supply of a service, new expectations arise. When one need is satisfied, other needs will also need to be satisfied and the relationship between demand, services and assets is often cyclical. Focusing on service supply alone is therefore not sustainable in the long term, as (DPWS 2001):

- demand will always outstrip supply
- the capital cost of additional assets must be considered in the light of the limited resources of the community at large, and
- it will cause the overall stock of assets to grow, bringing about an increase in the operating and maintenance costs of the assets.

Demand Management Process

Demand Management is an evolving process requiring ongoing review in order to achieve the most equitable, cost-effective and efficient service delivery and best use and distribution of resources. Organizations need to regularly monitor the effectiveness and achievements of their Demand Management processes and, where necessary, fine tune and/or re-define measures to achieve the desired outcomes.

Demand Management involves a number of key steps within the three characteristic phases of any strategic management process - Preparation, Analysis, Planning and Implementation.

- *The preparation* phase involves gaining a proper understanding of the stakeholders together with establishing the true costs of providing service. This provides the basic information for the
- *Analysis and planning* phase in which the demand is clearly identified and a response to its management formulated.

- In *the implementation* phase, a plan is prepared documenting the process stages including procedures for implementation, monitoring and evaluation of the defined Demand Management response.

This process needs to be applied at each stage of the Asset Management process and it is an essential part of the development of the Service Delivery Strategy.

2.10.2 Value Management

Male, et al (1998) define Value Management (VM) as proactive, creative, problem-solving or problem-seeking service which maximizes the functional value of a project by managing its development from concept to us. The process uses structured, team-oriented exercises that make explicit and appraise existing or generated solution to a problem by reference to the value requirement of the client.

Value Management may be described as a structured, analytical process for developing innovative, holistic solutions to complex problems. It has the following key characteristics (GAMC 2003):

- a specific methodology
- based upon a creative problem solving approach
- involves key stakeholders in a managed team approach
- focuses on function i.e. what it must do, not what it is
- focuses on achieving value-added solutions
- based upon on integration
- focuses on project learning

The greatest gains of Value Management can be achieved when it is directed towards obtaining maximum value from a total system. The examination of function remains fundamental, however this occurs within the system wide context. It is the systematic analysis of functions, which sets Value Management apart from other approaches to improving value.

Objectives of Value Management

Value management is a tool that has application at all stages of the strategic asset management cycle, from the identification of service requirements through to the

implementation of resource and asset plans. It may also be used in operational and maintenance planning. It provides the manager with a tool that can (DPW 2004):

- ensure that a project is cost-effective
- resolve a complex problem
- identify a number of options and assist in the selection of a preferred one
- identify the means by which a service may be provided
- review a brief
- identify the means by which a project may be delivered
- identify ways of providing functions at a lower total cost (life cycle cost)
- identify additional functions which improve the outcome of the project
- separate needs from wants and establish priorities
- improve the standard of performance or quality of the project outcomes
- generate commitment to outcomes through structured participation of stakeholders planning.

Value Management concept

Value Management is a structured, systematic and analytical process that seeks to achieve all the necessary functions at the lowest total cost consistent with required levels of quality and performance. Underlying the Value Management theory is the principle that there is always more than one way to achieve project objectives and that examination of the alternatives will produce the most acceptable conclusion (Male, et al, 1998).

Through the analysis of functions, wastage, duplication and unnecessary expenditure can be identified giving opportunity for value to be improved. The functional analysis perspective not only enables Value Management to explore the project and/or program brief but also to test the assumptions and needs perceived by the author(s) of the brief.

The concept of value as used in Value Management distinguishes this method from conventional methods of cost review. It achieves this by considering the relationship between function, cost, and worth. Value Management is not a review process, but a means to assist in the better management of the procurement process. Value Management essentially aims to produce solutions creatively and economically by (GAMC 2003):

- identifying unnecessary expenditure

- challenging assumptions
- generating alternative ideas
- promoting innovation
- optimizing resources
- saving time, money and energy
- simplifying methods and procedures
- eliminating redundant items
- updating standards, criteria and objectives.

Application of Value Management in Asset Management

The system based functional analysis of Value Management allows consideration of complex interrelationships. Consequently, Value Management has a broad range of applications throughout the strategic planning and procurement processes. It is particularly useful in focusing or distilling objectives and priorities, and in generating alternative solutions. The application of Value Management varies in intent and outcome depending on the timing within the delivery or resolution process.

In the strategic planning process, Value Management is especially useful in analyzing service strategies and in generating alternate and innovative options for meeting service needs. This includes identifying options that do not require additional capital investment for physical assets. At that level, Value Management can be used to (NSWT 2004):

- test and validate planning assumptions
- identify and confirm stakeholder values
- create a shared vision or agreed direction
- develop alignment to Corporate directions
- establish Master Planning principles and objectives, and
- define key challenges and strategies

Value Management benefits

Benefits of a Value Management Study are (DPW 2006):

- a better understanding of needs and the functions necessary to meet those needs
- a better definition of program or project objectives
- a better definition of quality and performance standards
- reduced wastage of resources
- capital funds savings
- improved operational efficiencies

- team building and strategies which
- create a climate of shared understanding
- reduce conflict and risks
- foster joint ownership of problems and solutions
- create new ideas for improved outcomes
- enhance the skills of the participants
- save on project development time and ultimate service delivery to the community

2.10.3 Risk Management

Risk is defined as the chance of something happening that will have an impact, either positive or negative, on objectives and/or outcomes. Risk management is the process of identifying, analyzing and addressing risks and opportunities on an ongoing basis – not only to avoid negative outcomes, but also to exploit emerging opportunities. It is a systematic process to identify risks that may impact on the organization's objectives, analyze their consequences and develop ongoing measures to treat them. It should be part of organization's corporate and project-management culture

Risk management is essential at all stages of the asset life cycle, whenever a significant decision has to be taken. The risks associated with the decision and their implications should be weighed with other factors when determining a course of action. The objectives of risk management therefore are to:

- systematically identify risks
- determine the magnitude of these risks
- develop ongoing measures to address them

Risk management should begin with service demand assessment and continue throughout the life cycle of the asset. It should be formally applied and documented during the Total Asset Management process when (GAMC 2003):

- Setting strategic directions,
- Developing and evaluating programs and projects, and,
- Entering into contracts with the private sector

2.10.4 Asset Information

Organizations can not effectively and efficiently manage their assets without knowing what they have, where it is, what is its condition, and what is the demand for it. Identifying the extent to which the asset meets current and future needs, recognizing short falls and examining running costs will facilitate strategic decision-making.

Unlike in the past when physical assets were managed with modest levels of information that was centrally recorded and historic costs were recorded only for accounting purposes. Local asset managers were familiar with each of their assets and less pressured to ensure their cost effectiveness. The environment in which public assets operate has changed and consequently, the Queensland's SAM states that the information necessary for agencies to manage their assets has also changed.

The increased demands for government services without a similar increase in government resources have led to a focus on service, and whole of life asset management approach. Consequently, the need for asset information has increased significantly. Asset Management requires the use of asset registers to provide an invaluable source of information of the organization's asset usage and on-going capacity as an efficient and effective service provider (DPW 2006).

Asset registers also provide the information base for further management improvement techniques such as benchmarking. The asset register should be seen as the core of an agency's information management system. The potential to integrate all the different functional registers and plans to create more efficient information linkages is growing as technology advances (GAMC 2003).

Asset Register

Asset registers, according GAMC (2003), are listings of information relating to various aspects of an asset portfolio, in a form that allows data to be cross-referenced and retrieved as required. Assets should be recorded if they have a service potential and/or the capacity to provide economic benefits used in delivering agency services.

An asset register is designed to record all assets on the balance sheet, together with basic information as to use, size, value, occupying department etc. The register is only to record the existence of the asset, in order that an accurate, regularly updated listing

is in existence. This basic information is then enhanced to form the basis of the asset database, which manages all asset data to support day to day asset management and performance measurement. An asset register may be computer, card file or paper based and contains data relating to one or more asset categories including (GAMC 2003):

- service delivery functions
- physical properties
- technical data
- financial information
- property title details
- key operational data
- maintenance data
- performance records

Strategic Asset Management Plan of the University of Tasmania, Australia states that the effective management of an asset portfolio is dependent on the availability of relevant, reliable and timely information. Asset management information must include the ability to (UTAS 2005):

- accumulate and report on the full costs of each asset;
- generate and record user charges;
- organise and monitor maintenance work; and
- record and report performance information.

Meaningful and up-to-date asset data provides the basis for all physical asset strategic planning processes. Asset registers should be reviewed regularly in order to update values.

2.11. Conclusion

This chapter has shown that asset management covers the procurement, operational management, maintenance, rehabilitation and disposal of assets, such that their use is maximized in regard to their service delivery potential and that risks and costs are managed over their entire life.

A comprehensive understanding of assets and their life cycle can allow asset owners and users to influence directly the quality of service delivery, and to optimize the

value, use and returns from the assets under their control. Some key elements of good practice in asset management are given below:

- An integrated approach to asset management across an organization, taking both individual departmental requirements and corporate requirements into account.
- Explicit and separate responsibility for strategic asset management.
- Clear and explicit objectives for holding assets which are based on an organization or government-wide view.
- Asset management decisions are planned in a co-coordinated manner and are consistent with corporate priorities needs.
- Changes to the portfolio that are achieved and plans and programmes that are implemented, achieve corporate objectives.
- A performance measurement system that is simple and robust with indicators which relate to objectives.
- Sufficient, comprehensive and accurate data to facilitate analysis of portfolios performance measurement and asset management decision-making.

Through the adoption of asset management approaches discussed in this chapter, the Nigerian Federal Colleges of Education can ensure that all physical assets are managed in a structured systematic and consistent manner that best supports the colleges' business aims, with the optimum utilization of both its short and long-term resources.

Asset management will provide the required informed input that will contribute to making the Colleges' budget planning cycle and process more effective. To ensure effective and efficient attainment of service delivery objectives, the asset management objectives of the Colleges should therefore focus on the following key areas:

- providing an asset base that matches and supports the business needs of the Colleges
- consolidating existing corporate capital assets and optimizing asset utilization;
- meeting its statutory compliance obligations; and
- aligning asset operating costs with business planning and service delivery requirements.

The Colleges need to use a structured approach to developing their forward plans for the provision of the right environment for teaching, learning and research. To achieve this, the Colleges, should in addition to the asset management approaches discussed in this chapter, also incorporate the concepts and principles of Estate Management and Facilities Management which are discussed in the next chapter.

CHAPTER THREE

FACILITIES AND ESTATE MANAGEMENT

3.1 Introduction

Understanding the role of buildings and how they can be deployed effectively, in the context of operations of each individual business, is the essence of both Facilities and Estate Management. Hence, these will increasingly form part of organization's core business strategy and operations. There is a clear trend in recent years that supports the proposition that the push by business to demonstrate value for money necessitates a management approach that embraces all businesses resources which emphasizes effectiveness on top of general economic efficiency.

This chapter which is basically in two sections therefore takes an overview of both FM and EM in the first and second sections respectively, with emphasis on their strategic functions and development. This is with a view to showing the interrelationship with Asset Management.

3.2 FACILITIES MANAGEMENT

3.2.1 Introduction

Organizations are recognizing the need to anticipate, shape and exploit a business environment that is becoming progressively synonymous with pervasive and rapid change in order to maintain and improve competitiveness. It is within this context that organizations are increasingly focusing their attention on maximizing the contribution of their internal services to the competitiveness of their core businesses. In particular, the role of organizations' facilities is attracting a widespread shift of conception, from an unavoidable 'dormant' overhead to a dynamic service which has the potential to progressively support the core business.

Facilities Management (FM) is about planning, providing and managing the productive work environment. It is a total set of process that operates at strategic, tactical and operational levels. These are discussed in this chapter, along with the

definitions, scope of FM and other relevant topics that gives a general overview of Facilities Management.

3.2.2 Defining Facilities Management

Facilities Management is an evolving practice and therefore, a range of definitions abound in academic journals, conference papers and statements from institutions and associations. There are virtually as many definitions as there are different types of organizations in the industry. Almost every source investigated gives its own version, only that some sources may refer to another's definition before citing their own, usually remarkably different, statement. Amaratunga, et al, (2001), for example, view FM as a *"term that encompasses a wide range of activities involved in effective management of built assets. It involves the total management of all services that support the core business of organization"*. While the US Library of Congress define facilities management as *"the practice of coordinating the physical workplace with the people and work of an organization, (it) integrates the principle of business administration, architecture and the behavioral and engineering sciences."* And the British Institute of Facilities Management (BIFM) gives a definition of FM as follows: *"Facilities Management is the integration of multi-disciplinary activities within the built environment and the management of their impact upon people and the work place"*.

Instead of definition, the Royal Institute of Chartered Surveyors (RICS) gives a description of FM thus: *"Facilities Management (FM) involves the total management of all services that support the core business of an organization. It deals with those areas that the managers of the organization consider to support their fundamental activities. FM focuses on the interaction between the core business, the support functions, and the facilities, throughout all sections of industry, commerce and service."* The implication of the above definitions and description is that FM is about the following:

- Supporting the core business of an organization
- Understanding the impact of workplace can have on people and how they perform in an organization
- A multi-disciplinary approach to the above.

College of Estate Management (CEM), Reading, suggest that after collecting and analyzing many FM definitions, it is clear that a description of FM achieves more than a definition. Definitions, although constantly being updated, are thought to be either too general or too specific and do not accommodate the rapid development of FM. Descriptions can allow for greater latitude and provide a more flexible format in which to convey the true nature of FM (CEM 2004).

In general, facilities are the tangible fixed assets required for an enterprise to function; for instance, land or real estate, buildings or structures, process machinery, and support equipment, both stationary and mobile (Muther 1979). Therefore, facilities are defined as the infrastructure that supports people in the organization in their endeavors to achieve business goals and they are the tools which people in the business have at their disposal to carry out their tasks (McGregor 1999).

Alexander (1996) observed that FM is first and foremost about organizational effectiveness. He further argued facilities management is the application of total quality techniques to improve quality, add value and reduce risks involved in occupying buildings, and delivering reliable support services. Such an approach is required to provide and sustain an operational environment to meet strategic needs of an organization. An ambience of quality can ensure that core business processes are well integrated and supported in an operational environment – the work place.

It is clear that FM is about planning, providing and managing the productive work environment. It is an umbrella term under which a wide range of property and user related functions may be brought together for the benefit of the organization and its employees as a whole. Therefore, the aim of FM should be not just to optimize running cost of buildings, but to raise the efficiency and stability of the management of space and other related assets for people and processes, in order that the mission and goals of the organization may be achieved at the best combination of efficiency, cost and quality. FM has the potential to contribute significantly, and it is important to identify and measure the extent that it supports, or can be adapted to the changing needs of organizations, and contribute to productivity, profitability, service and quality. The BIFM states that 'Effective Facilities Management, combining resources and activities, is vital to the success of any organization. At a corporate level, it

contributes to the delivery of strategic and operational objectives. On a day-to-day level, effective Facilities Management provides a safe and efficient working environment which is essential to the performance of any business – whatever its size and scope of works” (BIFM 2004).

The existence of active FM may also help to identify potential problems with maintenance and running cost before they result in component breakdown or even temporary shut down of buildings. It can provide a disciplined framework for the examination of many of the relationships between decisions and the satisfaction of the end user of the property, whether in economics or environmental terms. It also provides a framework for the review of user satisfaction as business and other circumstances change.

3.2.3 Scope of Facilities Management

A fundamental aspect of Facilities Management is its function as a link between the primary business functions and secondary support services within an organization. The International Facilities Management Association, IFMA describe the profession as managing and coordinating interrelated “people, process and place” issues and functions within the corporation or organization. (IFMA 2003)

Facilities Management of buildings covers both ‘hard’ services such as maintenance of fabric and engineering plant, and ‘soft’ services such as cleaning, security and catering. The Department of Trade and Finance (DTF) facilities management manuals states that in recent years, these services have assumed a growing significance because of the need to comply with increasing health, safety and environmental legislation, as well as the importance of identifying, controlling and minimizing the cost of operating buildings. This importance has been further emphasized as facilities, including their engineering services have become more complex to meet the requirements of users through the use of developing technologies (DTF 2005).

Then and Akhlaghi in Peter Barrett (1993) illustrates in Figure 3.1, the context and role of facilities management within an organization in terms of the organization’s business objectives.

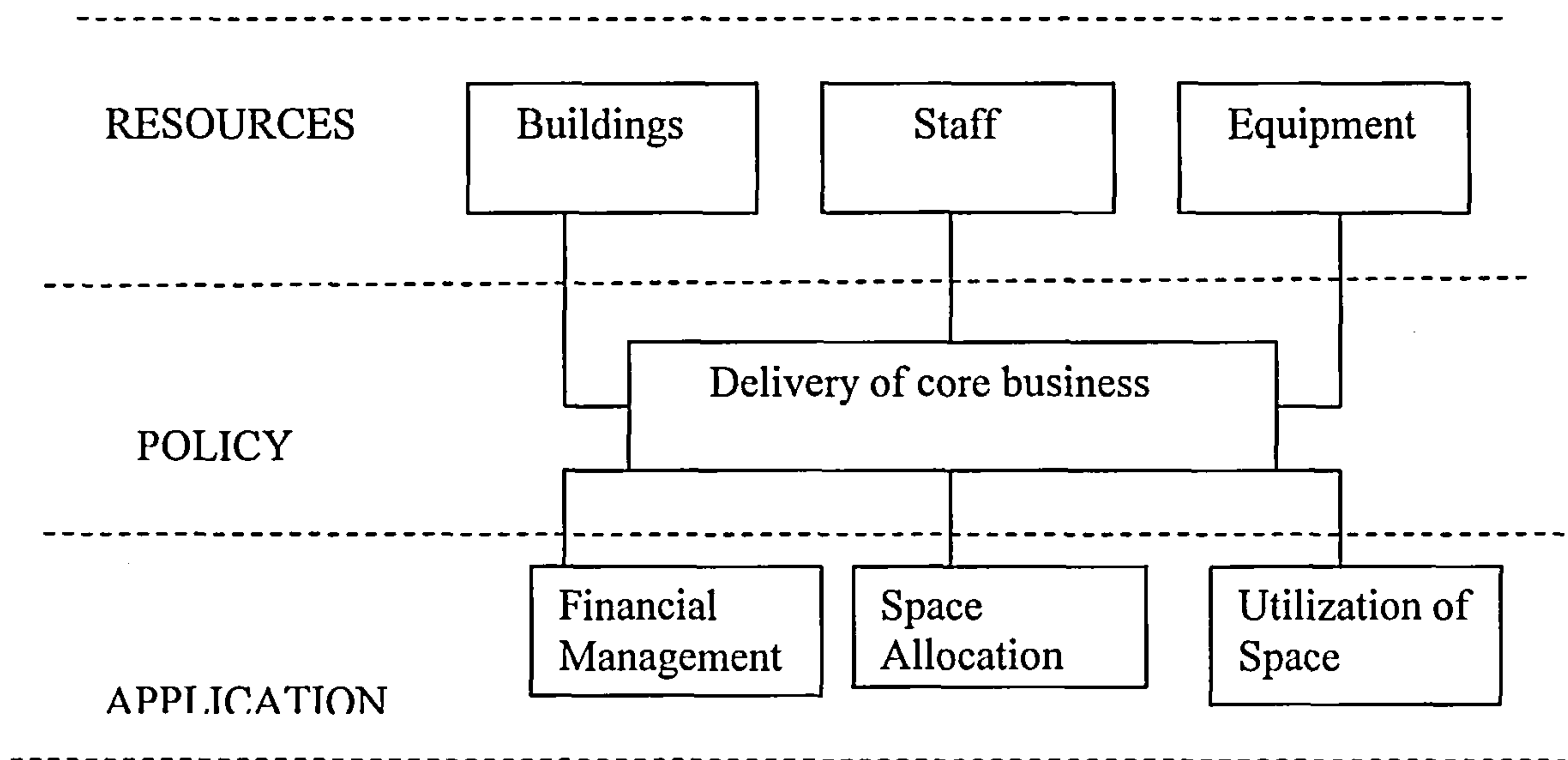


Fig 3.1: Facilities Management in its context - Adopted from Peter Barrett (1993)

In managing the relationship between the business performance in financial and qualitative terms and the financial provision of support services, the premises, together with people and equipment, represent the resource base supporting the fulfillment of organization's business objectives.

Facilities Management is also described as the process by which an organization ensures that its buildings, systems and services support core operations and processes as well as contribute to achieving its strategic objectives in changing conditions. The principal components of FM as described by Alexander (2000) are:

- The premises
- The support services, and
- The information services/information technology

The function of Facilities Management is really building a bridge between the changing workplaces and users (Alexander 1996). It focuses and develops appropriate action plans for property owners, managers and tenants of facilities to deal with current and future critical environmental issues in the workplace for customers.

Peter Barrett used three groupings to propose a model as in Figure 3.2, to express FM and tying into it, the concept of core and non-core business. To demonstrate the

variable nature of organizations, a fourth category is shown in the figure – that of personnel (or HR management) (Barrett 2003)

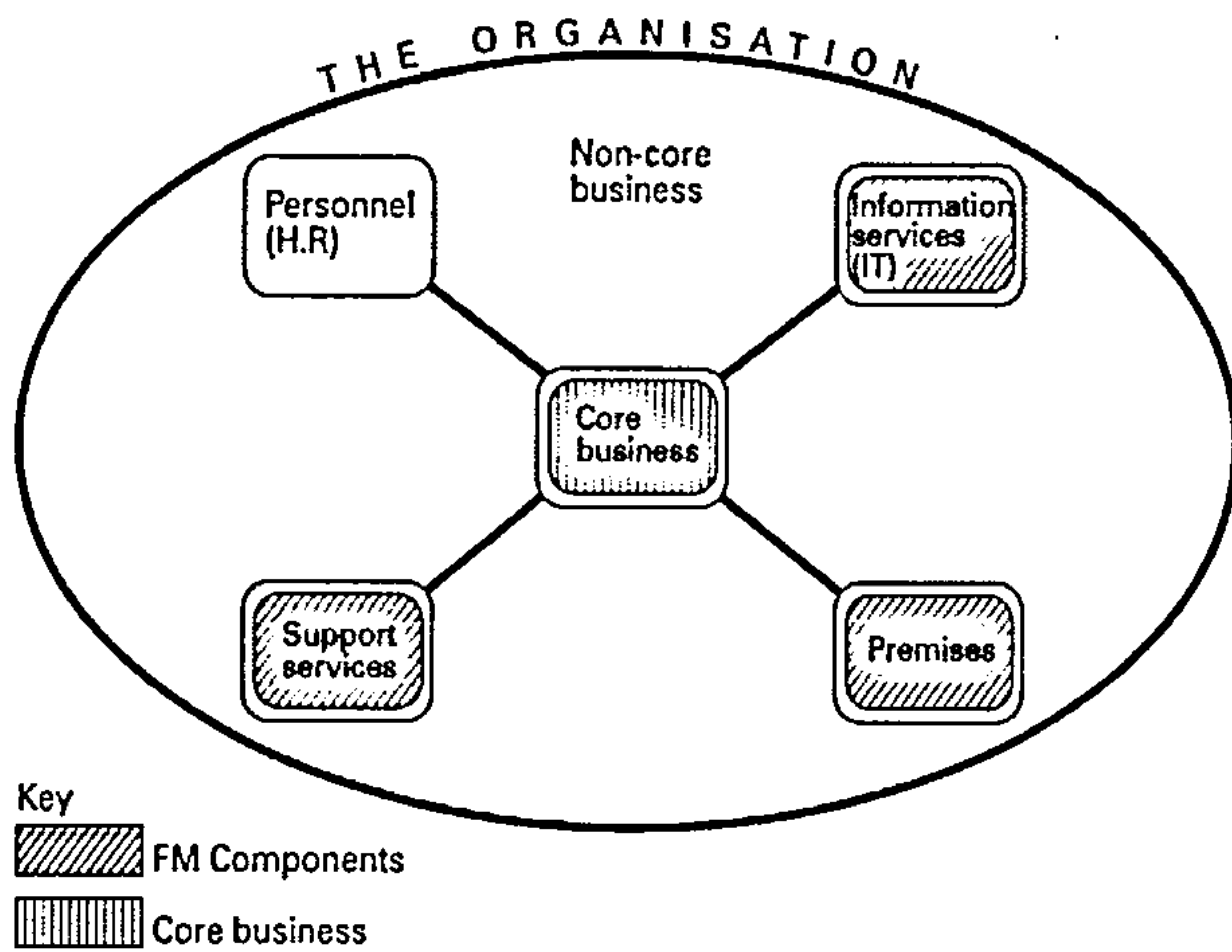


FIGURE 3.2 FM supporting the organization’s core business Peter Barrett, et al, 2003

There are a number of subheadings under each of the main FM components, some of which are described Figure 3.3 and Tables below:

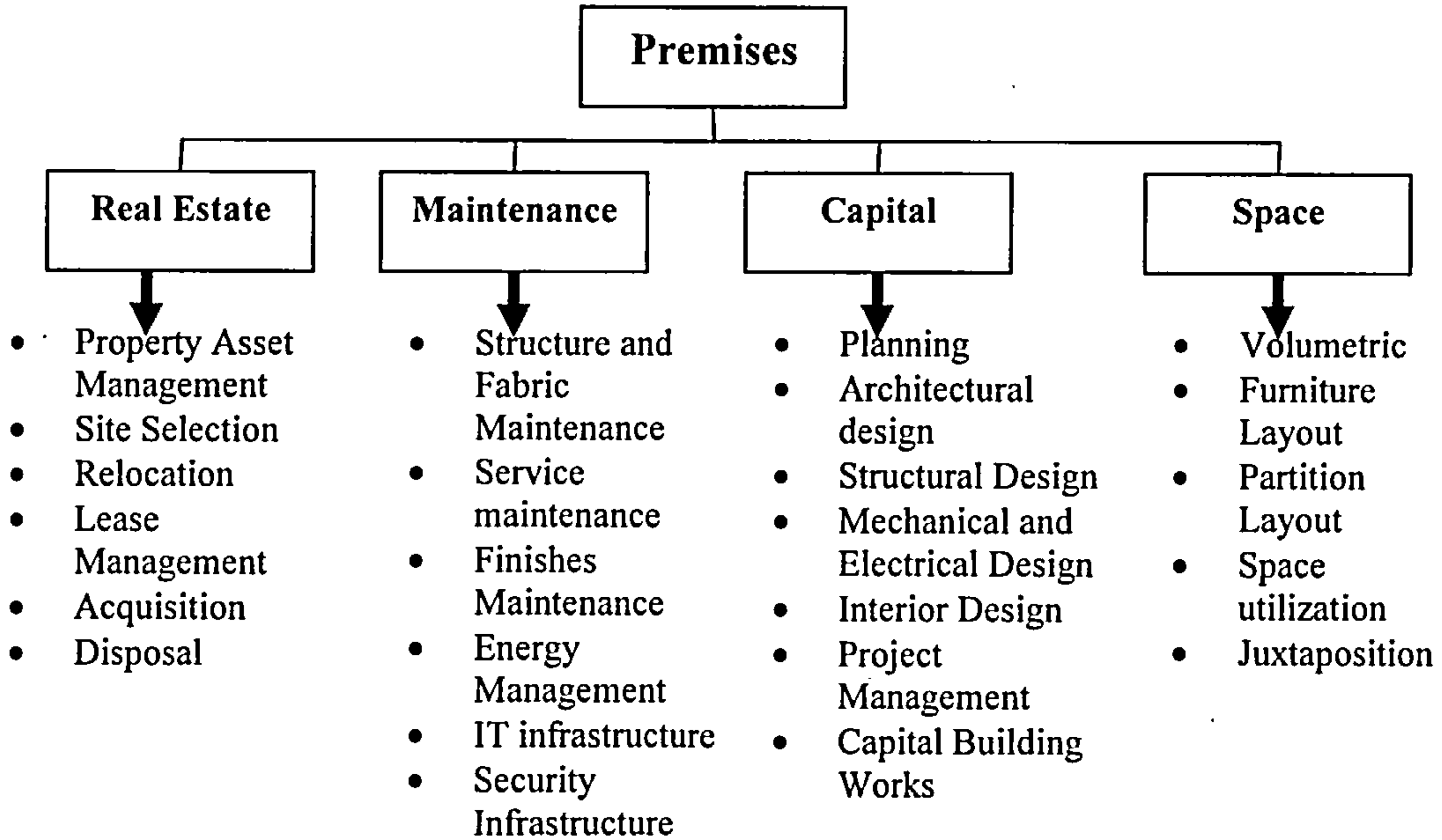


Fig 3.3 the Premises components of Facilities Management Adopted from Barrett (2003)

Support Services

Information Services

- Mail Services
- Car Fleet
- Catering
- Reception
- Housekeeping
- Office Administration
- Furniture
- Refuse Disposal
- Reprographics
- Security
- Stationary
- Travel
- Vending
- Data Network
- System Integration
- Voice and data Network
- Network management
- Wiring Installation
- Planning and Design Studies
- Software development

3.2.4 Approach to Facilities Management

Understanding the role of buildings and how they can be deployed effectively, in the context of operations of each individual business, is the essence of Facilities Management. Hence, Facilities Management will increasingly form part of core business strategy and operations (Nutt 2000). The many and varied functions performed by the facilities manager are not new, but the trend towards an all-embracing professional who harnesses complementary functions together into a cohesive approach to workplace management – the coordination of people, process and workplace – is new (Payne 2000).

Recently, the overall approach of facilities management has taken a different emphasis (Jones 1998). There is a shift from Facilities Management as a separate subject to a total approach including all the support services within an organization or for more organizations working together (Everards 2003). This more comprehensive approach calls for much higher levels of competence and business skills than traditionally has been evident among many facilities management practitioners (McGregor 1999).

According to HEFCE (2000), Institutions that need to gain the benefits of FM need to adopt a planned approach that takes into account management input, evaluation of options, implementation cost and so on. Institutions are recommended to define the service level required against their strategic objectives, and to understand the important contribution made by these services to business success.

To be effective, management of facilities should embody strategic, tactical and operational dimensions. Developing service oriented funding mechanisms, investing in staff training and management skills, and adopting quality service standards are other issues that senior management teams of institutions need to consider. If Facilities Management is to be developed further, its role needs to be reflected more clearly in job descriptions, responsibilities and management skills.

3.2.4.1 Developing Management Approach

A flexible approach to FM has been advocated. Individual managers should be allowed greater flexibility in meeting service demands through coordination with other support service arrangements. The following issues are then considered (HEFCE 2000):

Alignment of Activities: As the nature of FM services changes, so business opportunities will need to be re-evaluated and business case revised. As stakeholder requirements change, there may be changes in elements of the organization's core activities. These are dynamic changes with implications for the arrangement for key support services.

Reviews of key support services and subsequent actions should be determined by clearly defined statements about service standards and delivery process to achieve the organization's business objectives. Organizations are recommended to define service levels required against their strategic objectives and to understand the important contribution made by these services and the essential interconnections.

Management Structures: Having developed objectives and assessed potential synergies from the functional groupings of support services, organizations will be able to consider the most appropriate management structure. As an example, the management structures in higher education for the traditional service areas usually reflect estates and/or facilities management disciplines within job titles. Under each job title there is commonality among some institutions in assigning the responsibility for support services.

Informed Client Function: The key to effective FM procurement process is defining the ‘informed client function’. This role may be undertaken by a member of senior management team or by a group of individuals who are independent of the more detailed procurement processes. They should ensure that organizations requirements, in terms of standards, are reflected in any procurement process, be it in-house or contracted out. The informed client function is a critical one, acting as the client representative for both internal and externally procured support services. It requires a thorough knowledge of existing arrangements and of the organization’s business, culture, values, goals and objectives. Informed client function involves coordinating views within the organization in establishing service level arrangements from service providers (whether internal or external); and in formulating the institution’s corporate strategic plan, to set the objectives. The role also includes coordinating FM service reviews.

Developing management Skills: HEFCE (2000) recommends flexible working and enabling staff to acquire multi-skills. The present need is therefore for directors and managers to develop management skills with a strategic and tactical, as well as an operational, focus. The Facilities Management role and functions can be assigned within the institution’s senior management structure, with the individual roles of director and manager requiring a broad range of skills, to meet the demands of the institutions business. There is need for greater investment in staff development and team building. This is an important area for organizations to consider.

3.2.5 Adopting FM

The nature or focus of Facilities Management may vary between organizations, ranging from strategic through tactical to operation management task. Alexander (1996) is of the opinion that organizations should have a clear strategy and well developed policies for facilities management embodied in a facilities plan, and should establish a single point of responsibility. He further stated that “the way in which facilities are organized in relation to central functions and to other relating units will determine the extent to which facilities support strategic needs”. (Alexander 1996)

Organizations that want to gain the benefits of FM need to adopt a planned approach that takes into account management input, evaluation of options, implementation costs

and periodic reviews. Basically, there are three dimensions to develop such an approach: strategic, tactical, and operational. This is illustrated in a Barrett (2003) diagram shown in Figure 3.3:

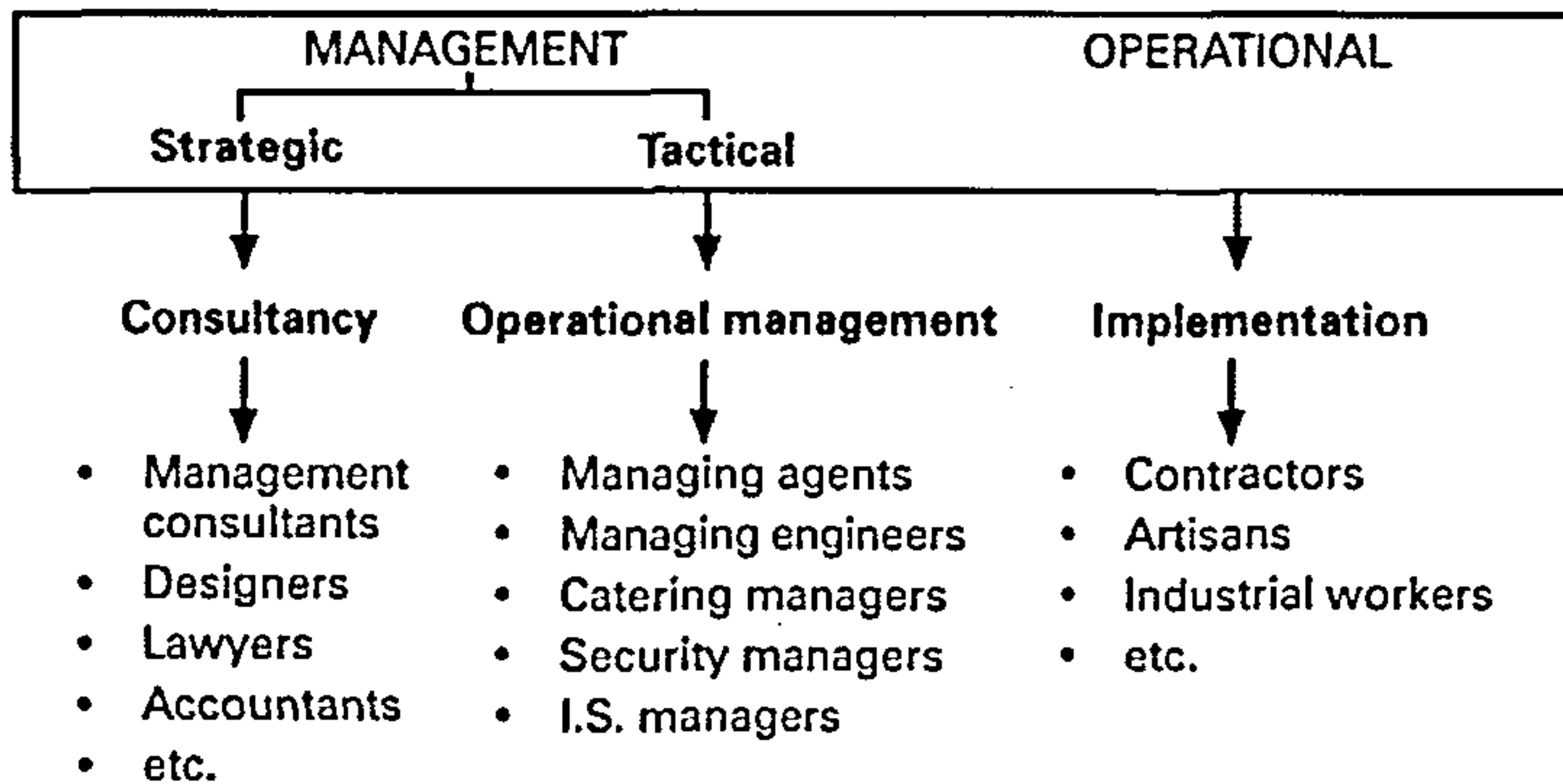


FIGURE 3.3: How facilities management is carried out - Adopted from Barrett, et al, (2003)

Facilities Management is a total set of process that operates at three levels: strategic – where key planning decisions are made; tactical – where analysis and design process take place; and operational – where implementation and day-to-day running of facilities process are handled. These are discussed in the subsequent sections.

Strategic Facilities Management

Basically, the aim of strategic FM according to Barrett (2003), should be to achieve a strategic fit between core business needs and the provision of facilities management. It is managing the response to business priorities. The main issues here relate to setting the overall framework for FM, including the vision, purpose and culture of the organization. An essential task is to establish a rationale that guides the support management. The organization can apply the rationale systematically to identify clearly how services may contribute to business success. Organizations will want to decide what services and physical resources to include in their FM arrangements. The way in which strategic and operational elements of facilities management work is illustrated by Barrette in a generic facilities model illustrated in Figure 3.4.

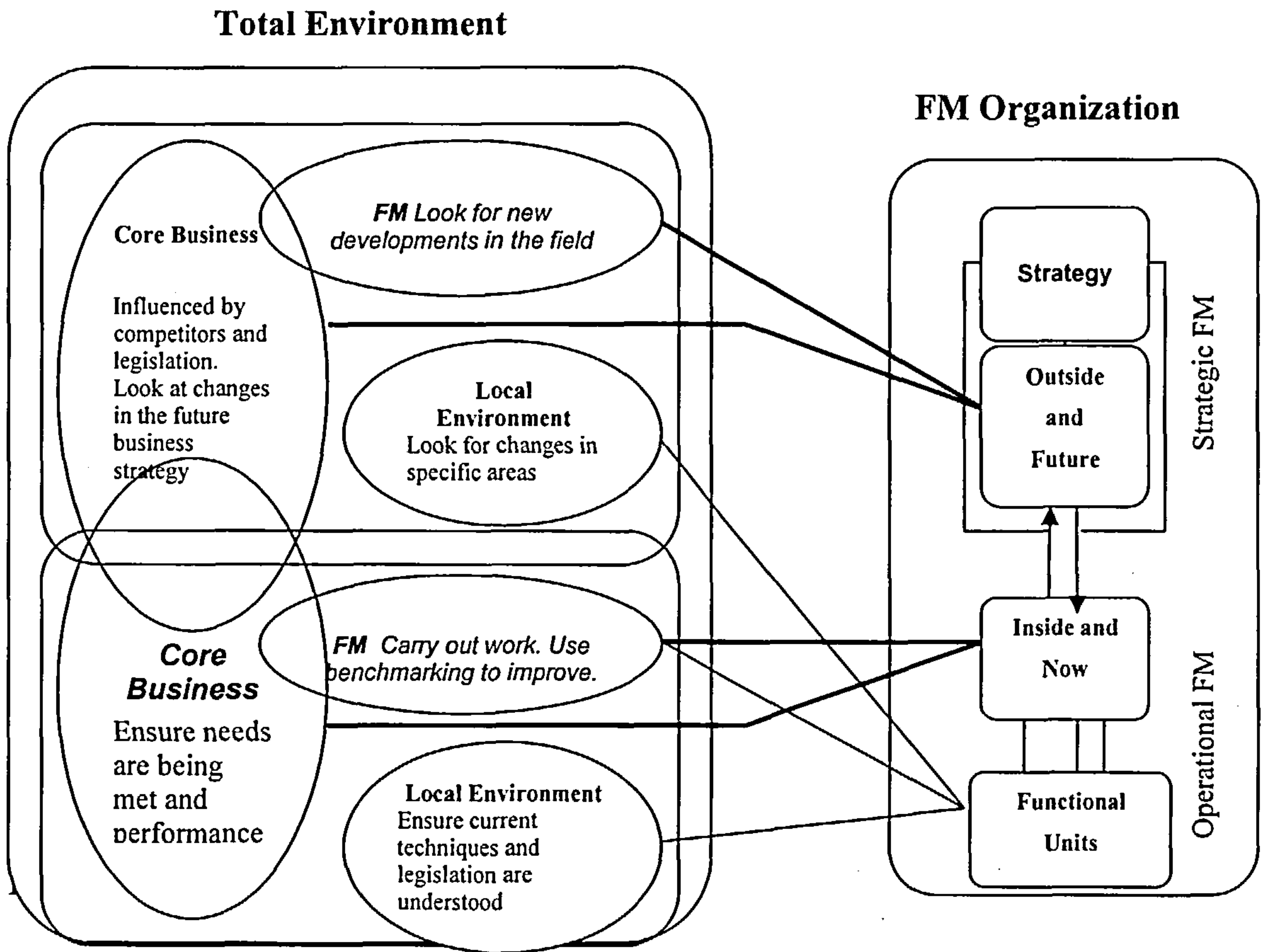


Fig 3.4 Generic facilities Management Model Source: Barrett (1998)

Using the model in Figure 3.4, relationships and interactions can be seen between the facilities manager or Facilities Management Company and the core business. This allows the facilities manager to respond to any changes that may occur in the business such as increased or new competition, enabling a strategy to be developed that will keep the facilities services provided at the desired levels.

The facilities Manager will also look for any developments that occur within the facilities management sector, such as new techniques, technologies, legislation and ideas or ways of thinking. The above interactions will help Facilities Management to develop the strategic framework allowing the organization to move in a positive and sustained direction towards the strategic objectives that it wishes to achieve. The strategy allows the facilities management organization to effectively make decisions feeding through to the operational side of facilities management so that current operations can be delivered while still considering and moving towards future trends.

While the relationships and working interactions that are described above and shown in the generic model represent the way in which operations should work, it is important to note that the reality is often much different. The difference between reality and the ideal working situation is often due to the ways in which organizations handle and manage the different interactions and the emphasis that they place on the different aspects of building a strategy. In any organization, the strategic aspect of planning for the effective provision of services offers opportunities for economy, efficiency, effectiveness and competitive advantage.

If an FM approach is adopted, the varying requirements and use of the organization's physical resources and support services will be agreed and clearly defined response to its strategic needs. The different procurement options for satisfying those needs may then be implemented, or reviewed as necessary.

Strategic Planning for Facilities Management

For any organization to attain success in the management of its facilities, it is essential to infuse rational tools and procedures into the strategic planning process. It is only through this rationalisation that strategic facilities management can achieve a strategic fit between core business needs and the provision of Facilities Management. However, the above factors, backed up by case study evidence (Barrett, 1995), illustrate that in reality there may be a huge chasm of misunderstanding between the two groups and thus many facilities departments are forced to remain in a reactive operational mode. Obviously such problems cannot be conquered overnight and changes are unlikely to happen unless the facilities team can demonstrate how a facilities strategy, designed to support the core business strategy, could benefit the organisation. It may be that the facilities team will have to formulate a strategy, discussing the implications at various stages with key members of staff within the core business, in order to gain their support. Then hopefully the facilities team will be in a position to approach senior management and demonstrate why the facilities strategy should be considered alongside the core business strategy.

In the parlance of Andrews (1987) the facilities strategy can be viewed as the pattern of decisions within the facilities management function which determines and reveals

its objectives, produces the principal policies and plans for achieving those objectives, and defines the range of service provision the function is to pursue, and the nature of the contribution it intends to make to the core business.

So how should a facilities department go about producing a facilities strategy? Obviously organisations vary substantially and so will their strategies, but the facilities manager may find it helpful to follow the process illustrated in Figure 3.5:

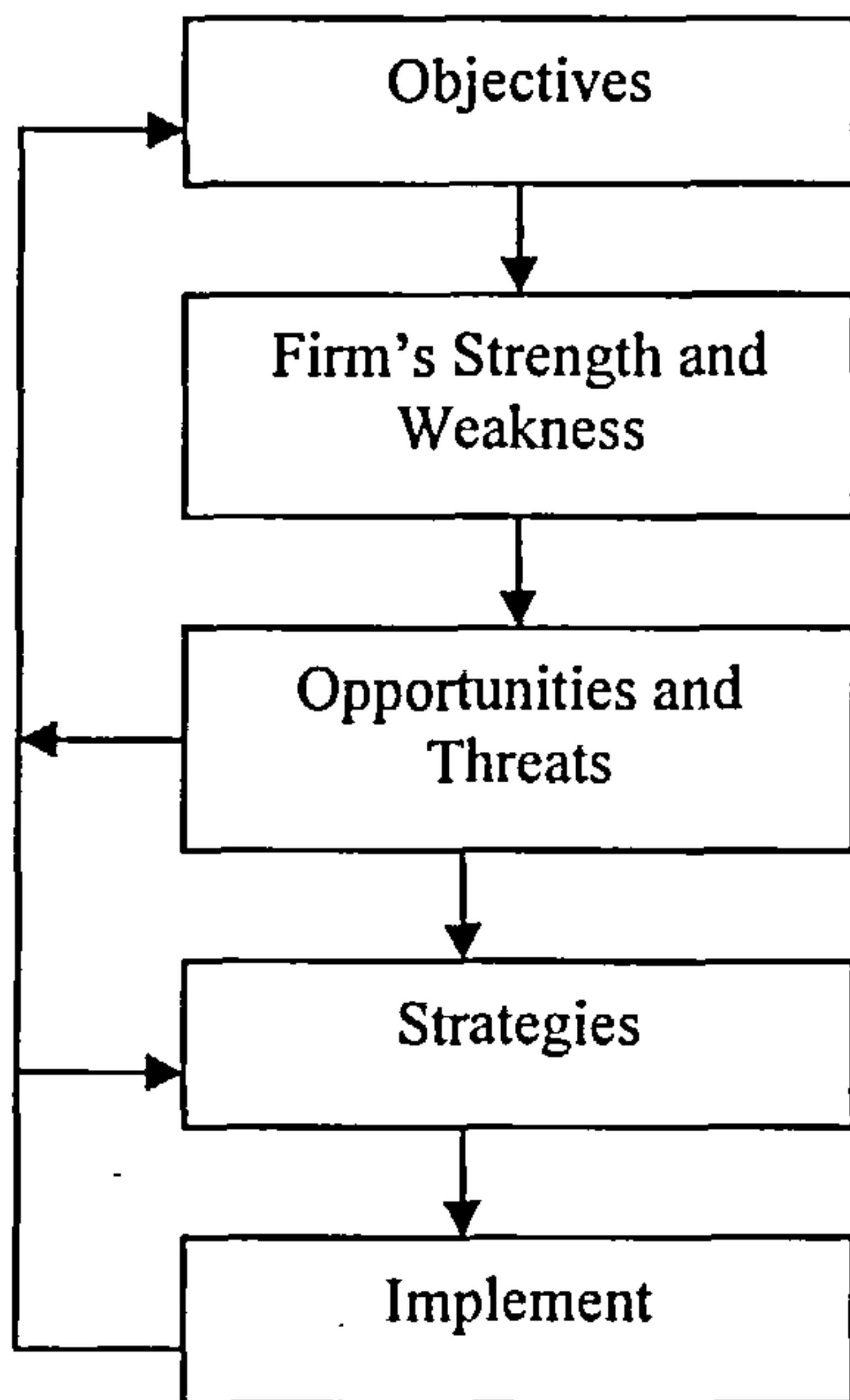


Fig 3.5 Strategic Planning Process Adopted from Agenti (1980)

Objectives

The first stage of any strategic planning process is to determine the objectives of the organisation. According to Adapting Slack (1991), the Facilities Management should aim to link their objectives by making sure that they are: *appropriate*, in that the objectives should advance facilities activities towards making a positive contribution to the competitiveness of the core business; *coherent*, in that all the objectives should synergistically interact to avoid conflict; and *consistent over time*, in that the objectives should be flexible, but not so changeable as to cause uncertainty and loss of credibility. In the case of a facilities strategy this will mean interacting with the core business to see what their objectives are and what changes are likely to occur over the next few years. As stated earlier, many facilities departments often do not understand what the core business is; therefore this stage may take a while. Only when the

facilities group understands what the organisation's objectives are, will they be able to identify how they as a group will need to change to meet the challenge ahead. In doing this, a 5 -10 year perspective should be taken to draw consideration beyond a purely financial view.

SWOT analysis

Having identified what the organisation intends to do; the next stage is focused on the facilities department itself and involves analysing the group's *internal* Strengths and Weaknesses and then the *external* Opportunities and Threats that it may encounter in the future (Porter, 1980). "External" in this context would include the core business. This element of the process is becoming increasingly well known and is commonly referred to as a SWOT (Strength, Weakness, Opportunities, and Threats) analysis. The aim is to produce a relatively short list of the major factors that the organization ought to take into account when formulating its strategies.

Developing a Strategy

It is important that in developing a strategy for the organization to consider the clients needs and wants. Strategic Facilities Management should aim to provide an appropriate fit between the core business needs of the client and the provision of Facilities Management. The route of developing a strategy will naturally throw up new ideas and divert unwanted ideas on the way to implementation of a desired strategy. Figure 3.5 illustrates the way the realized strategy is developed.

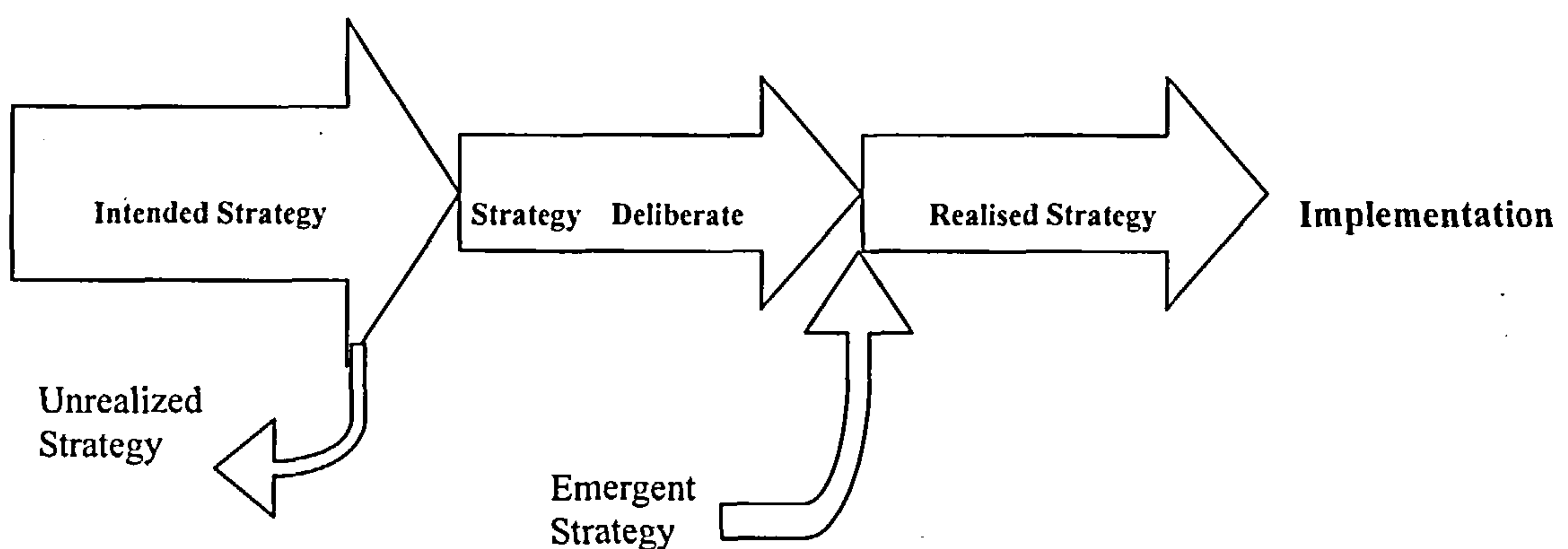


Fig 3.6 Development of Strategy Source: Barrett (2003)

Firstly the facilities management team needs to establish the objectives that it wishes to meet and move towards its realization. This will also mean interacting with the core business to establish its objectives and likely changes in future. Establishing the needs and objectives will allow the facilities manager or organization to identify the areas that it needs to change. A long-term view should be taken when developing the strategy and identifying objectives in order to genuinely improve the level of service and quality.

Identification of the organizations strengths and weaknesses is an integral part of developing the strategic plan. Analysis of its strengths and weaknesses should be carried out. It is important to look at all aspects of the organizations activities, rather than focusing purely on finance and performance. Operational performance, technology, organizational structure and culture, people, finance, legislation and economics should all be examined to identify how the organization should move forwards. The results of the analysis will provide the basis for and how the objectives of the developing strategy are to be met.

Once the facilities organization has identified its objectives, analyzed its internal and external strengths and weaknesses and where any possible threats in the future may arise from, the organization can identify the precise changes that need to be made.

Relationships between FM and Corporate Strategic Planning

It is critical that facilities management and corporate strategic management mesh. Sexton (1993) argues that if the facilities management function is to provide a well focused service provision, it should be elevated to a strategic level by the organisation. Firstly, this enhanced strategic status would allow the facilities management strategic layer to scan the changing internal and external environments for information and trends that may impact upon its activities; rather than using the filtered interpretation of the environment from the corporate strategy perspective which may exert a very different set of, possibly, inappropriate influences on the facilities management strategy. Secondly, based on this enriched information, the facilities management function would be in a position to inject meaningful input into

the formulation of the corporate strategy, thereby creating synergy between an organisation's core business and its facilities.

The synthesis of Adler *et al.* (1992) and Becker (1990) provides a more descriptive-diagnostic dimension to this conceptual prescription by proposing four possible relationships that could exist between facilities management and corporate strategic planning:

- *Isolated* - the facilities management provides day-to-day operating support, but is itself relatively unimportant to the rest of the organisation and makes a minimum contribution to the planning process.
- *Reactive* - the facilities management largely reacts to corporate strategic initiatives, but rarely identifies its own long-term strategy.
- *Proactive* - the facilities management has a reciprocal and interdependent relationship between itself and the corporate strategic planning process. Here facilities management is viewed as credible and important. It is proactive and fully involved in helping guide the development of strategic plans.
- *Integrative* - the facilities management has a dynamic, ongoing dialogue, both formal and informal, between the facilities management planners and corporate planners. At this level the facilities manager would both support the core business and help create new opportunities by being involved in all strategic business decisions, even those that do not directly concern the facility function.

Tactical FM

The tactical level focused on developing appropriate policies and systems to establish what is needed, including issues relating to quality, value and risk. It is basically the level of managing the process of delivery. This requires planned approach: that is an evaluation of options, provision of resources and input of management time (Gelnay 2002). The role and responsibilities of stake holders will also require definition, within a structure that clarifies the role of clients, customer, user, service provider and supplier. Changes to management structure may also need to be considered and implemented.

Also important according to Barrette (2003), are consideration for quality (fitness for purpose), value, cost and price. Value relates to performance standards that are achieved through adopting a quality approach. Standards should be agreed for operating procedures as well as service performance, to ensure that customers' needs are met.

Operational Facilities Management

The operational level will involve using the agreed systems, monitoring results and taking appropriate action to secure and maintain the desired targets and standards. It is the level of managing performance. It also requires investment in staff training and development; consideration of options for change; and the definition of appropriate management structures and service standards. Quality ought to be consistent; performance benchmarking underpins consistency (Barrette 2003).

The functional units that operate within the organization are directly related to the responsibilities and work that is required under the specific agreement. The functional units should carry out their instructed work while being aware and understanding of current techniques and practices. Any difficulties, exceptional cases or new developments that the functional units come across should be reported back to facilities manager.

3.2.6 Implementation

By this stage the facilities team should have a workable facilities strategy that has been developed with the cooperation of key staff from the core business. Consequently, the facilities team should now be in position to approach senior management with their ideas. It is probably highly unlikely that senior management will agree in the first instance to every proposal and so the facilities manager should not be disheartened if he or she is not welcomed with open arms! As stated earlier, it may take years before facilities strategies are viewed as an integral part of the

organisation's strategic planning process. However, if the facilities team have a fully researched and co-ordinated strategy, Amaratunga (2000) observed that senior management will hopefully be persuaded to allow some of the suggestions to be put into practice. Consequently the facilities team will now be at the implementation stage. Thus it will be necessary to identify individuals within the department who will be responsible for pursuing matters on a day-to-day level. A mechanism that can assist in this respect is to request that those identified for a given area provide a brief review of that area and also provide specific targets for the next year, plus an outline of future actions. In this way the strategies become owned at operational level and thus the department should make definite progress towards achieving the required changes.

The current requirements of the core business should be regularly monitored through meetings and evaluation of any new needs that may need to be catered for. As a quality and improvement tool, benchmarking of the functional units performance, according to Alexander (2006), should be used and this should be done in an internal and an external environment. The benchmarking and evaluation of user needs will enable the organization to deliver an effective level of service provision while feeding back the results to the facilities manager for evaluation and use in strategic management.

3.2.7 Audit/Review

In order to successfully implement the strategy, individual members of the staff will need to be allocated duties that will allow the organization to move forward towards the objectives that have been identified in the strategy. Implementation of the strategy will involve a constant review process where step-by-step targets are the basis of improvement. Yearly targets, with outlines for the future goals steadily allow the organization fulfill the long-term strategy. The review process that the organization adopts allows them to assess their current situation and see how they are shaping up for the long-term targets. It may be necessary observed Alexander (1996), for the organization to rethink the targets, and possibly the strategy, that they have set as in some cases; certain aspects of the organization may not be able to improve at the

desired pace, either due to being in a sub-standard state or possibly due to other restrictions that may have been imposed upon it.

The setting of specific individual targets means that a control mechanism is now in place that allows the targets to be periodically and systematically reviewed. Thus the next stage is to establish a monitoring system to track whether the targets are being achieved and whether this is being done in the most effective and efficient manner. It is important to remember, however, that the targets are being pursued for the benefit of the whole organization and so the facilities group must ensure that their activities remain relevant to what is occurring in the core business. If necessary, the organization may have to reassess the situation and revise their targets, or even rework their strategy entirely (BFM 2004).

Stakeholder Relations and Facility Performance

Following Jones, et al, (1998), Facilities Management must consider the needs of all building users, together with the situation of others who might be affected by the management of the building. Hence in the case of operation, attention is directed toward the determination of information structures inside organizations, which are treated as “teams”. Although a team – members of an organization – needs to have the same interests and beliefs, they do not share the same information (Philips 1988). For example, the information that stakeholders circulate (provides and receives) can be imperfect, incomplete or asymmetric. According to management theory, it can be reliably assumed that stakeholders to the asset and operation of a building will have different aims, interests, aspirations, competitors, levels of satisfaction and information at their disposal. Part of the task of the facilities manager is to accept these disjunctions and to negotiate workable symmetries into operating situations.

The ‘symmetries’ would encompass the standard microeconomic elements of effectiveness (doing the right thing, or using resources to socially valuable ends) and efficiency (achieving the defined and desired outcomes with minimum attribution of resource inputs) (Wadley 2004). In allied terminology, these elements embody the concept of allocative efficiency (effectiveness), and productive efficiency (efficiency as defined). In order to enable organizations or businesses continuously to improve

performance and, hence, add value to organizations and stakeholders, consideration is required of effectiveness as “adding value to business performance” and efficiency as “driving down occupancy costs”. Indeed, details of both effectiveness and efficiency have been widely considered in business operations (Butt 1985). However, the term refers respectively to aggressive and defensive actions, so a balance between them needs to be struck in any practical setting (Nutt 2000).

Facility performance is usually measured via performance indicators and by a process known as benchmarking in relation to performance outcomes. Indicators represent a set of measures focusing on the aspects of performance that are most critical for the current and future success of the organization. The focus therefore is either on the aspects of performance that require improvement, or on those which must be kept within a specified level to ensure the continued success of the organization (Baker 2002).

Although there are two types of indicators, performance measures and performance indices, they are both about identifying (Timo 1997):

- where there is need for improvement,
- how can performance be measured, and
- what changes will bring about improvement

As the success of facilities managers depend on asset performance, they need to determine a set of key performance indicators (KPIs) to help organizations set and reach individual goals, and then use these KPIs to measure the progress made towards achieving these goals – especially when the goals are about to change or need to be improved (Timo 1997). Although most indicators concern financial outcomes (for example pounds spent or earned per meter square), there is no single performance indicator for every organization (Baker 2002). Facilities Managers and management teams need to tailor their own for individual measurement.

To optimize performance in the Facilities Management of buildings to meet stakeholder orientations, consideration of performance outcomes is essential. Thus, Facilities Management has its rationale in performance. In order to relate performance

within Facilities Management in the built environment with business achievement in terms of performance indicators and outcomes, a list of facility conditions to investigate in different built environments and a suitable building type to demonstrate these conditions become a fundamental requirement.

3.2.8 The Facilities Manager

Within this fast growing professional discipline, Facilities Managers have extensive responsibilities for providing, maintaining and developing myriad services. These range from property strategy, space management and communications infrastructure to building maintenance, administration and contract management. This firmly puts the emphasis on the performance of the organization and infers an added-value approach.

Facilities Managers are generalists who, according to Rondeau (1995), understand the corporate business philosophy and respect its financial, legal and quality requirements. They facilitate and manage budgeting, interviewing and hiring consultants, set design, construction, furnishings, scheduling, space and office furnishing standards, capital purchasing programmes and translate corporate customer facility requirements into cost effective, environmentally safe and aesthetically pleasant workplace.

Alexander (2000) observed that the strategic facilities managers will be judged by their managerial capabilities rather than their technical competence. In many cases, this will mean adding business, social and personal skills to a base of technical skills.

3.2.9 Conclusions

From the foregoing, it is apparent that facilities management is an important part of an organization's ability to effectively deliver the services that it provides. FM's role is to support the core business of an organization, primarily through coordinating the non-core business components of premises, support services and IT. It can genuinely help an organization gain a competitive edge, help staff to work in more efficient and pleasant environments or offer financial benefits through more efficient processes.

Facilities Management needs to create an environment in which people know what needs to be done to support the core business better. To develop a robust mechanisms and linkages that embed an organization's decision making processes and activities within an appropriate strategic framework therefore is to consider FM activities as falling into three layers: strategic, tactical and operational. The strategic layer identifies its present and future service offerings, as well as establishing strategic checkpoints to evaluate its progress toward the accomplishment of given strategies. The operational core executes these strategies. The tactical layer concerns itself with linking the strategic layer and operational core effectively and efficiently to ensure that actual outcomes conform to strategically intended outcomes.

Institutions of learning require support services that offer the best reliable standards to internal and external customers in terms of quality, time and value. FM is about establishing an integrated management and resources infrastructure that will enable the institutions to meet the clearly identified and agreed requirements (needs and wants) of their stakeholders. Underpinning any decisions in facilities provision, is the constant interplay between the pulls from three key resource drivers: that of people, technology and the workplace environment (property). This therefore leads to the discussion of the related estate management in the subsequent section.

3.3 Estate Management

3.3.1 Introduction

The principal objectives of Estate Management are to provide buildings which are efficient and safe and which effectively support organizational activities, and to achieve the maximum benefit from estate as a resource. It seeks to ensure efficient utilization of property as an input resource to the organization's primary function. Organizations usually devise a strategy to manage their estate resources. This should include development of strategic and tactical plans, and monitoring system to measure the effectiveness of their strategy at meeting their organizational objectives.

This section therefore takes a look at the estate management framework and development strategic plans that will align with organization's corporate goals.

3.3.2 Defining Estate Management

Estate Management is widely interpreted as being concerned with the administration of tenanted land or property. The Irish Property and Facilities Management Association IPFMA, see it as "the establishment of an appropriate framework within which to oversee property holdings to achieve agreed short and long-term objectives, having regard to the purpose for which the estate is held" (IPFMA 2003), while the definition given by the Royal Institute of Chattered Surveyors, RICS put it as "all facets of the use, development, and management of urban land, including the sale, purchase, and letting of residential, commercial and industrial property and the management of urban estate; and advice to client on planning".

Stepleton (1986) defines estate management as 'simultaneously a generic description of a broad range of activity and specialist discipline'. For the purpose of this project, the description given by Duben and Syce (1991) is adopted. The Authors take estate management to mean the management of large number of properties, probably of different types, held by an individual or single organization such as a company, school or local government authority, probably for a variety of motives. For example it could refer to the management of a company's property holding comprising of headquarters building, production and distribution units, trading outlets, or local authority with offices for occupation, council housing, schools and other units used for statutory purposes together with investment lands. In the later cases the manager will be trying to balance the financial and social needs of the local population. The keynote in each case is that the properties tend to be disparate in type, tenure and ownership motivation. They may or may not be concentrated geographically.

3.3.3 Estate Management Framework

Estate Management practice is influenced by procedure developed over many years and exercised by a profession evolved over several hundred years with all the strengths and weaknesses inherent in such groups. Tim Stapleton observed that during

the sixteenth century changes in social and trading conditions and the rise of growing number of smaller landlords created an environment in which the science of measurement, recording and presentation of boundaries was able to develop (Stapleton 1986).

Corporate real Estate Management, refers to the management of property that is incidentally held, own or leased by an organization to support its corporate mission. As such the primary value of corporate real estate is not its investment value but rather how it contributes to business operation. The real estate function within a corporation exists mainly to support its strategic and operational objectives. It provides support to both senior and line management in the form of strategic facilities planning as well as specific analytical and transactional activities. "These services, orchestrated by professionals of the corporate real estate and facilities function enable the corporation to acquire, manage and dispose of its real estate interest within acceptable cost and time parameters" (Rondeau 1995).

Property ownership can indeed tie up large amount of capital and management energy that business could employ more productively elsewhere. Competitive pressures, accounting changes and increasingly sophisticated occupier requirements are building demand for new and innovative ways to satisfy corporate occupation needs. The current vogue for shareholder value, combined with increasing globalization and changing work practices have all combined to center attention on performance of corporate real estate. Pottinger (2000) observed that organizations are now being challenged to manage their real estate proactively and as an integral part of corporate strategy to gain competitive advantage in their industry.

Institutions of learning have increasingly recognized the importance of good estate management. They understand the need to ensure their mission and objectives are supported by effective arrangements to manage the estate and its associated facilities. The Higher Education Funding Council for England, HEFCE states that an institution's estate is one of its most valuable assets. "It creates the first impression of the organization, so it is a key element in marketing the institution. Appropriate budgets therefore need to be set to address the level of work identified as necessary by the institutions to achieve: a suitable learning, teaching and research, and social

environment; statutory compliance; maintain building condition and energy efficiency” (HEFCE 2000).

The funding council further observed that Estate Management should be undertaken in a methodical and systematic way such that it is aligned with the academic needs of the institutions; otherwise it will be of little benefit. That puts a responsibility on both estate professional and the academic community. In particular, unless there is communication and consultation through out, there will be little sense of ownership and little motivation to work towards the achievement of the institution’s strategic objectives.

To manage the estate optimally, there is the need to develop a strategy which draws its aims from the institution’s corporate plans and establishes the estate needs to achieve these aims. The strategy should look at the buildings and facilities available and address potential shortfalls in space, surplus space, unsuitable or in appropriate space. It will also consider opportunities for development, rationalization or reconfiguration of the estate.

Estate Management issues in higher education institutions include: land; buildings and improvements to owned and leased buildings; maps and development plans lay outs; valuation, lease and insurance; environmental and safety; landscape and parking.

3.3.4 Strategic role of estate management

In recent years financial issues and the role of the real estate as an investment has gained prominence. Property has come to be seen as a facilitator of an organization’s operations. In line with this new role, increasing attention has been given to property with the development and adoption of new management techniques. Some of these techniques are operational. Some techniques are due to seeking to align the provision of property with corporate strategy.

Further more, the economic imperatives imposed by global competition and the continuous drive for improved performance has promoted a need to consider the

implications of strategic decisions on the corporate physical asset base. Such implications, opined Then (2000), include:

- Business increasingly demand flexibility in response to competition in order to survive, the supporting physical infrastructure (the corporate real estate portfolio) must be able to respond accordingly, increasing a proactive management approach, based on full knowledge of the portfolio (that is, opportunities as well as constraints).
- Buildings *as operational property* and the space business units occupy is a legitimate expense no longer hidden within the corporate overheads.
- Buildings *as physical assets* are durable assets demanding a life-cycle approach in their management over time.
- The *service element* of the delivery of facilities related services (customer interface) is seen as a critical dimension of the facilities-provision and facilities-support service delivery package

From the foregoing therefore, it is clear that strategic management of property requires the coordination of business and property strategies. The adoption of business planning to the property provision will bring a longer-term perspective, and achieving this requires consideration of three aspects each with distinct and dynamic strategic implications for the organization. The aspects, according to Kenley and Heywood (2000), are:

- The property assets are part of organization's capital and therefore compete with other assets for allocation of organization's capital finance;
- Property financing criteria, consisting of both the financing methods available to provide property's investment value; and
- Customer interface through retail outlet or some other means of providing service to customers.

The purpose of developing a business strategy is to focus the operations of the business in ways that are predicted to bring success and gain competitive advantage. The estate management process that can bring about such an advantage is therefore discussed in the next section.

3.3.5 Estate Management Process

The application of the general function of management to estate, according to Stapleton(1986) can be seen as a process, the complexity of which, and frequency with which it is repeated, is appropriate to the nature of each individual estate.

A proactive management model of the corporate real estate resource necessitate constant two way dialogue; from strategic management – the strategic intentions and direction of where the organization is going, from operational management – the best way of achieving the desired outcome (Then 1995). The conceptual framework which justifies the need for a constant dialogue between strategic management and operational management is illustrated by in Figure 3.7.

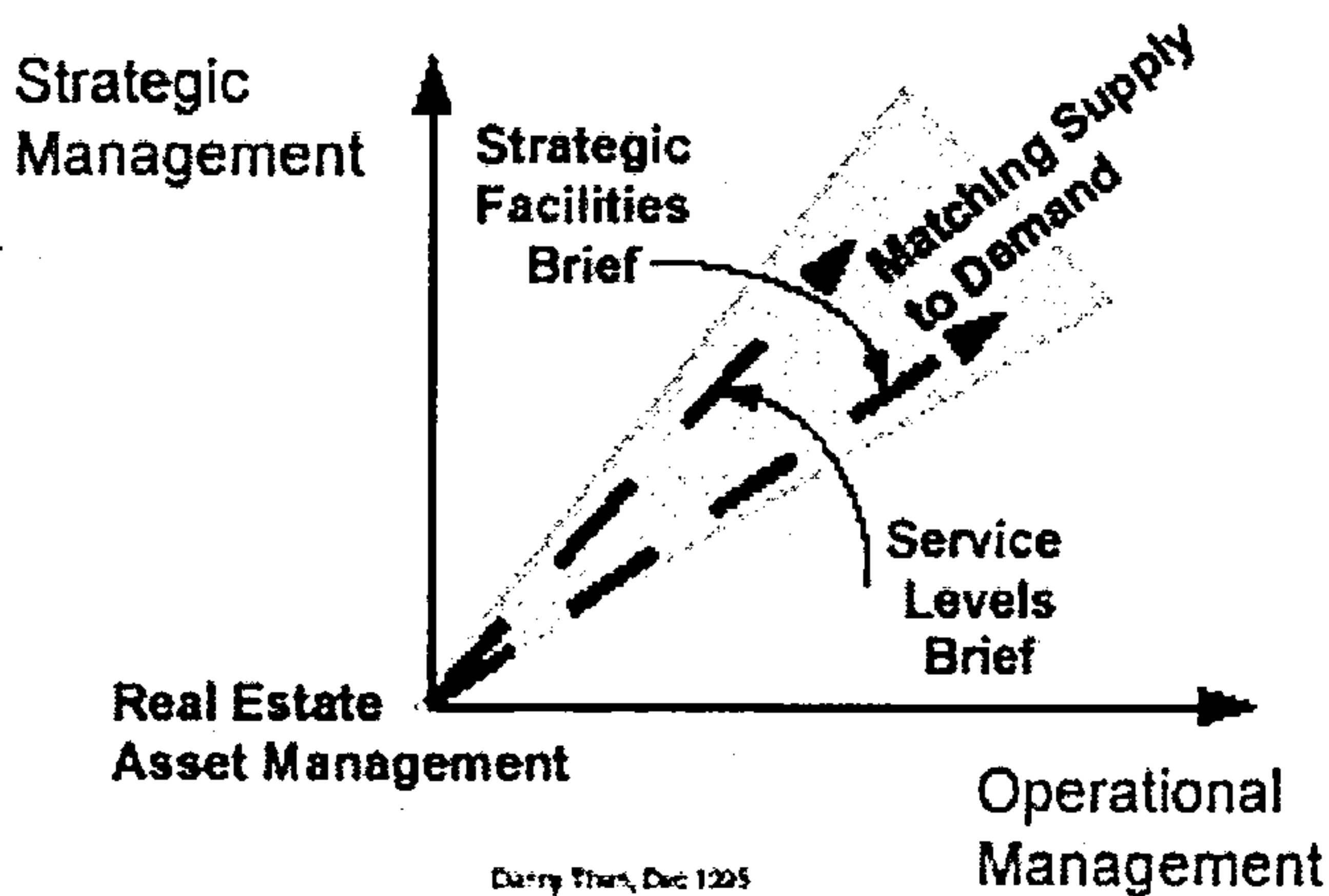


Figure 3.7: Real Estate Management as Integrating Mechanism Adopted from Then (1995)

The above figure is given as a conceptual representation of current practice of real estate management in many organizations. A key requirement of proactive model is not only to raise awareness of the two sides of strategic importance of closely aligning the estate resource to the corporate strategic intent, but to establish channels of formal communication that keep both parties fully informed of the external market and its likely implication on the corporate operational asset base.

Strategy and Tactics

The responsibility and objectives of the estate and facility function should be established through strategic planning, from which all other estate and facilities plans

and action should emerge (Rondeau 1995). The strategic planning process should not operate only on a top-down fashion. Doing so will ignore the real estate function's valuable knowledge of the market, stakeholder needs, inventory status, and the risks and opportunities surrounding its estate asset base.

Acknowledging property's significant worth to the organization, through property's influence on the organization's ability to deliver its business aims is basis of property's strategic importance. As property is strategically important, its management to meet organizational strategic ends is required. Support for strategic corporate property management is also required from high levels within the organization if its adoption is to be successful. There should also be a support for the strategic consideration of the estate resource as an integral part of prudent business management. The principal aim is to strategically integrate, and to continuously align the supporting role of the corporate operational property assets with the organization's business plan.

Stapleton (1986) identified property as part of the organization's capital considerations. The consequence of this is that property strategies need to be coordinated with the organizations capital strategies. The estate and facility function and other corporate functions in the strategic planning process should have an interactive and, in many instances, a proactive relationship. Strategic estate considerations should be linked to the core business strategy of an organization. A written statement of some broadly based goals will enable the policy maker to give emphasis and weight between these and so react to changes in underlying factors. The strategy should be subjected to regular review in order to address emerging problems.

Further Education Funding Council for Wales (FEFCW) Estate Management Manual states that all institutions should have an estate strategy, the main purpose of which is to ensure that institutions have an appropriate estate for meeting the current and anticipated needs of academic and support functions, particularly given the increasingly rapid changes within the education sector. The estate should be appropriate in terms of location, size, configuration and quality (FEFCW 2001). Given the significant capital and recurrent cost associated with institutional estates, it is essential that land and accommodation are used effectively and efficiently. An

important component of all estate strategies will be an assessment to determine if space can be managed more effectively and efficiently in order to accommodate existing and future requirements and, where possible, to assist in minimizing capital and recurrent estate costs.

Estate Strategies, according to the Scottish Further Education Funding Council, are strategic documents which contain contextual information and demonstrate the means by which the estate will be used as a resource to contribute to the achievement of the institution's strategic objectives (SFEFC 2000). It draws its aims from the institution's corporate plan, and establishes the estate needs to achieve these aims. It looks at the buildings and facilities available and addresses potential shortfalls in space, surplus space, and unsuitable or inappropriate space. It also considers opportunities for development, rationalization or reconfiguration of the estate.

The estate strategy, in terms of its estate, land, properties, etc is essentially an institution's plan for considering where it is now and, within the context of its overall strategy, where it wishes to be in the longer term. The strategy outlines the key estate objectives and considers options the institution may take in order to reach the desired future.

Benefits of an Estate Strategy

An institution's estate is one of its most valuable assets. On average, 12 per cent of its income will be used on the estate. The 'look and feel' of the estate has a major bearing on the perceptions of the institution as a whole, by staff, students, and commercial and local stake holders (HEFCE 2000).

In addition, the long lead times of capital projects, the interrelationship between one project and another, and the large sums of money involved mean that developments have to be planned well in advance. It is therefore essential to have a plan for the estate in order to make the best use of physical resources for the benefit of the institution and its surrounding community. A well thought through estate strategy can also play a significant role in attracting external funds, particularly where there is competition for funding.

The estate strategy is the key means by which the estate, as a major resource can be reconfigured and adopted to meet existing and future requirements for the institution within its strategic plans. It also provides an assessment of existing lands and buildings against the strategic goals of the institution and an evaluation of options for developing the estate and clear direction for working towards continuous improvement in relation to fitness for purpose and quality. HEFCE (2000) sees estate strategy as a process, rather than an end in itself. It also recommends that estate strategy should be developed taking into account, the financial resources available and the institutions' overall corporate plan.

Estate Strategy Development Process

Developing an estate strategy is an important process and the Higher Education Funding Council for England, HEFCE provides a comprehensive guidance for the development of an estate strategy by individual institutions. Estate strategies should be relevant, up to date and sustainable. They should also be affordable and feasible within the funding framework of both public and private resources. HEFCE noted that the strategy should be supported by a plan to assist its implementation and be subject to ongoing monitoring and review to ascertain the extent to which the stated objectives have been achieved. Developing an estate strategy will require a sufficient knowledge of academic plan as well as financial strategy of an institution. This is termed as a planning triangle as shown in Figure 3.8 (HEFCE 2000):

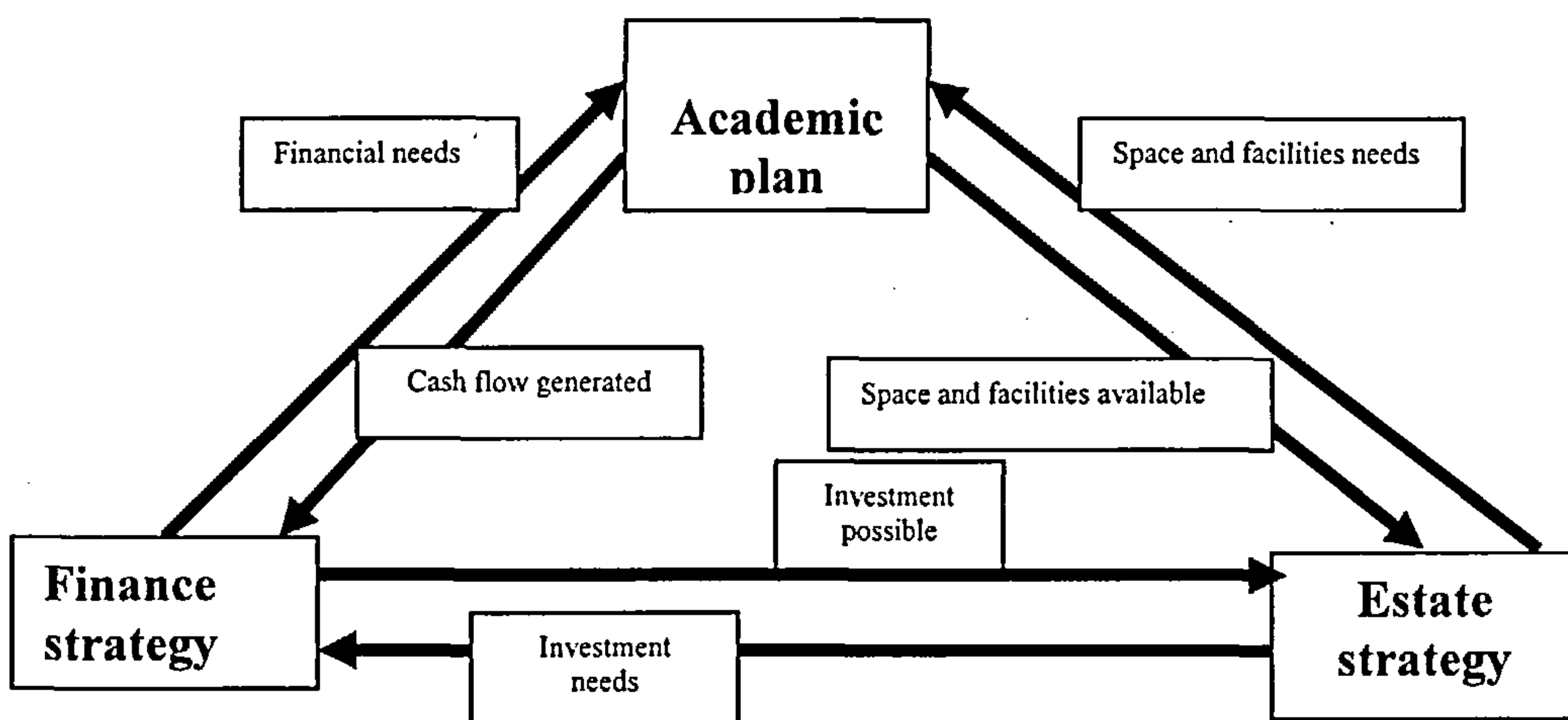


Figure 3.8: The planning triangle adopted from HEFCE (2000)

The processes for developing an estate strategy are many. What matters, however, is taking into account the key issues discussed so as to ensure that effective and efficient strategy is developed. Developing an estate strategy is a key process, which will provide a framework within which the institution's aims can be developed and realized, and ensure that limited resources are invested in the most effective way.

3.3.6 Implementation

This according to FEFC (1996) is the field in which the Estate Department staff should have most training and experience. If the selection of the preferred tactic is followed by clear and concise brief, and assuming staff of reasonable competence are available within an organizational structure appropriate for the task, then implementation should be the least difficult part of the process. It can be assisted by availability of an estate management manual and access to specialist advice. The content and regular review of the manual is a major function of the senior estate staff. The act of producing the manual and its regular review will provide senior staff with the opportunity to clarify their own approach.

Some of the estate management functions and activities that organizations now need to carry out are outside the traditional core skills of estates-related staff. This may lead to the need for new appointments, structures and skills to be introduced. Estate management practices within organizations vary widely. In some organizations, all aspects of estate management are contracted out, usually with one individual in the management team responsible for estate matters. In others, large estates departments and direct labour teams have been formed which undertake the majority of estates activities in house.

There is no universally-applicable right way to manage an organizations portfolio in terms of organizational structure. What is clear however is that the organization's management structure should facilitate the integration of property considerations into the decision-making process.

At the operational management level, the main concern is with the delivery of the functional operation space in the right place, at the right time and for the right

economic price. The on-going management of the estates over time must strive to balance the requirements for flexibility in supply of space (measured in terms of quantity), and appropriateness and affordability in supply of associated facilities services (measured in terms of service quality)

3.3.7 Control

Whilst the information contained in a regular system of reports is interesting, it is only useful when measured against some objective, either quantitative or qualitative performance criteria. Since control follows from delegation, the pattern of responsibility will indicate the necessary form of control. Information must be collected and then presented in such a form that the decision-maker can reach conclusions on action at various levels of both policy and implementation. The information contained within the core data set should, with appropriate analysis, be sufficient to plan and manage the estate so that it is capable of sustaining the business objectives. In this context, Hedley, et al, (1999) observed that information is required to:

- Monitor the effectiveness of expended resources;
- Rationalize the estate to meet both current and future needs identified in the business plan;
- Carry out meaningful option appraisals and prepare budgets;
- Plan the control of the capital programme, replacement and upgrading and identify priorities; and
- Identify the cost of the estate management function.

Data is not required for its sake, but to provide essential reference and assist in measuring performance. Without the right data, the right decision cannot be made.

Performance Evaluation

Fundamental to good management is the setting of performance monitoring procedures. These will enable the contribution of the estate and its management to be assessed from individual actions and premises through to total impact on the organization. Organizations set performance measuring systems to assess the effectiveness of their strategy at meeting their objectives and to improve decision making. (Walters 1996). In details it may be used

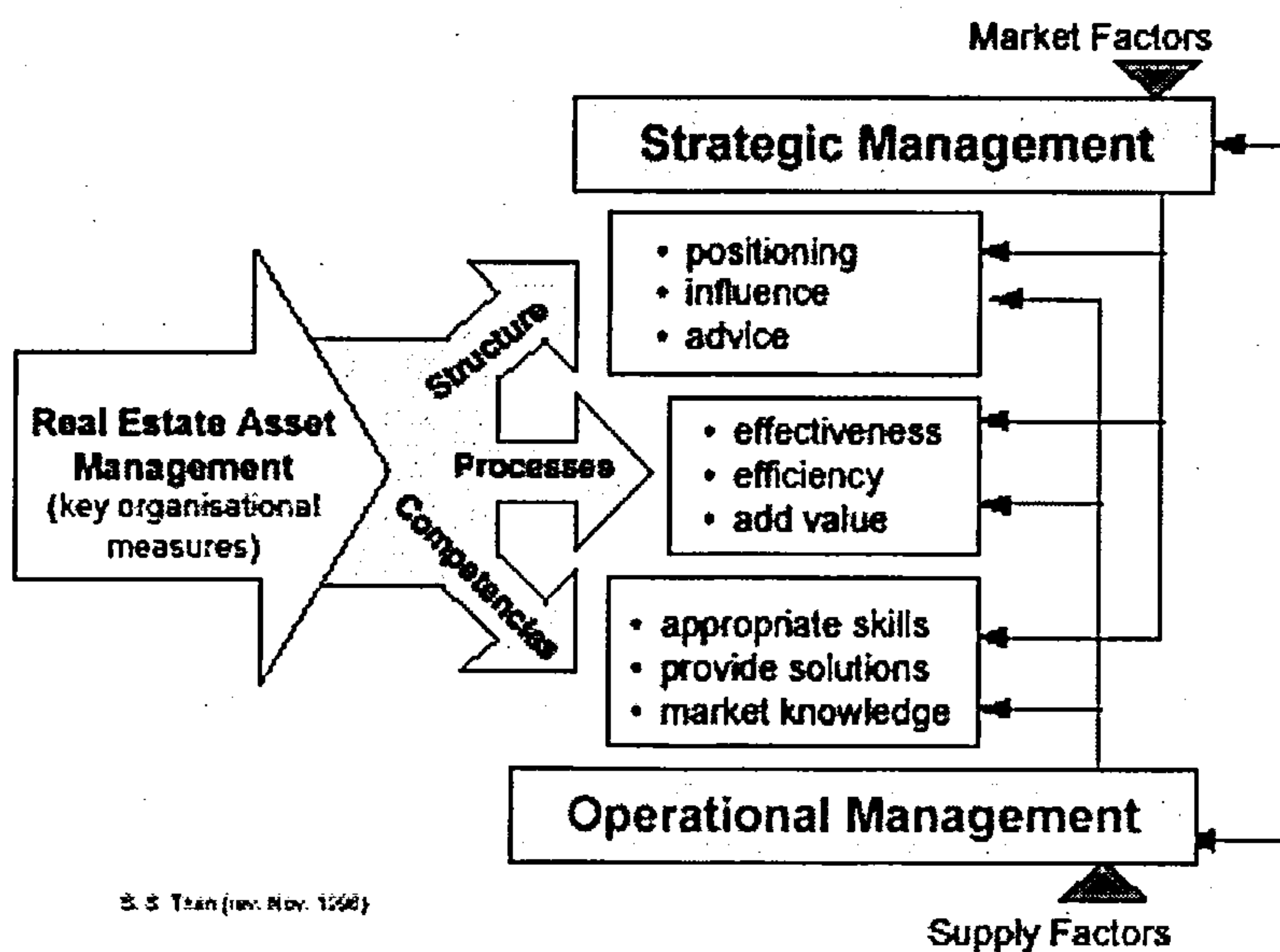
- To improve the performance of the organization in terms of efficiency, effectiveness and quality of product or service.

- Inform decision makers of links between performance and budget
- To motivate staff to improve performance.

The role of operational real estate resources within an organization must evolve to accommodate changes in the market place. The desired outcome from real estate asset management in physical form is an appropriate portfolio structure that is aligned with the organization's business operational requirements. The realization of an integrated approach necessitate a formal planning framework that must cater for the cultural, procedural and existing knowledge base of the organization concerned.

Then (1997) chose three measures for evaluating the performance of real estate management within an organization. The choice of the measures according to him, are driven by the need to measure how organizations respond to managing their operational real estate as business resource. Figure 4.6 illustrate a model that proposes the performance of real estate management can be evaluated in terms of three key organizational variables:

- *Structure* – organizational set-up for operational real estate provision and facilities services management.
- *Process* – the systems and procedures for the management of the delivery of operational assets and their associated facilities support services.
- *Competences* – the necessary skills required for an efficient and effective delivery system – both in-house and brought-in expertise.



B. S. Tean (rev. Nov. 1998)

Figure 3.9: Estate management key organizational variables. Source: Then (1996)

The performance of real estate management is seen as the outcome whereby the above three organizational variables as *structure*, *process* and *competences* must work in concert.

3.3.8 The Estate manager

Estate Management activities should be performed with the benefit of functional expertise and knowledge. Beyond being able to manage the baseline of work required to be carried out, the estate manager should be capable of identifying the sporadic demands of the estate for services. That requires an ability to stand back from the routine of operational estate management and take a strategic perspective. Furthermore, the estate manager should be able to deal with strategic matters and be empowered to do so.

Whilst there may be a consensus of opinion by the estate owner, whether an individual, board or elected members, as to the goal or goals to be pursued, the Estate Manager has a more difficult task. Alternative tactics will exist, all of which can achieve that goal. The choice of preferred tactic tests all the qualities of the estate manager; judgment, knowledge, technical expertise, financial acumen and personnel management.

3.3.6 Conclusions

Estate Management, as the term suggests, is a management activity. It is therefore concerned with matters such as organization, resourcing, reporting, monitoring and control. Proactive management of the corporate estate resource demands clear strategic direction and measurable deliverables from operation management. After its students and staff, the estate is the most important asset of an institution. It directly supports the delivery of teaching and research; it provides stimulating and supportive environment for students and staff alike. An appropriate and well managed estate is therefore critical to delivering the institution's core business objective in a cost-effective way.

Buildings and land as physical assets are relatively static products. Effective matching of demand for, and supply of, functional accommodation and associated support services to meet operational requirements in an institution demands the management of the estate as a dynamic integrated process. The realization of an integrated approach necessitates a formal planning framework that accommodates other related services that ensures very conducive workplace environments.

3.4 Conclusions from EM and FM

The desired outcome from EM/FM in physical form is an appropriate portfolio structure that is aligned with the organization's business operational requirements. It is important to point out that underpinning any decisions in facilities provision is the constant interplay between the pulls from three key resource drivers: that of people, technology and the workplace environment (property/place). Buildings and land, as physical assets are relatively static products. Effective matching of demand for, and supply of, functional space and associated support services to meet operational requirements in a dynamic business environment demands the management of the estate assets as a dynamic integrated management process. The realization of an integrated approach necessitates a formal planning framework that must cater for the organizational and procedural variables, and the existing knowledge base of the organization concerned.

The next chapter discusses how EM and FM inter-relate with Asset Management and share common objectives, and also the process of developing an interim asset strategy model, using asset management concepts, complemented by EM and FM.

CHAPTER FOUR

4.0 THE INTERIM ASSET STRATEGY MODEL

4.1 Introduction

The Colleges under study have vast physical assets without which they cannot operate. The value of investments in these assets must therefore be maximized for the success of their present and future corporate objectives. From the literature discussed in the previous chapters, it is clear that the Colleges need an integrated approach towards asset planning and management for them to deliver quality asset based services effectively and efficiently. This can be achieved through the formulation of asset strategies covering acquisition, maintenance, refurbishment, redeployment and disposal, together with related estate and facilities management strategies and tactics.

By integrating asset planning with its overall planning processes, the Colleges will be better able to make most appropriate decisions about their asset profile, particularly when responding to such factors as:

- New or changing service delivery requirements;
- Different methods of service delivery; and
- Evolving technology

Developing an Asset Strategy involves a very long process and rigorous field exercises. An Interim Asset Strategy model, based on a literature review, was first developed which was tested during the field studies and then the model was improved upon, based on the outcomes of the studies. And this is what is basically discussed in this chapter. In developing an Asset Strategy, it is important to also incorporate the concepts and principles of Estate Management and Facilities Management, as discussed in the previous chapters, as they are all interlinked and share the common objective of providing an enabling workplace environment to fulfill corporate objectives. How AM, EM and FM differs has also been discussed. The strategy brings together, issues relating Estate Management, Facilities Management, Asset Management and those issues that are general and common to all; in order to develop a system that will bring about improvement in the way assets and facilities are

managed in the Colleges. This chapter therefore discusses the strategies and how the Interim Asset Strategy Model was developed, prior to the filed studies.

4.2 Critical Analysis of AM, EM and FM

Asset Management has been extensively discussed in *Chapter two*. It covers the procurement, operational management, maintenance, rehabilitation and disposal of physical assets such that their use is maximized in regards to their service delivery potentials and that risks and cost are managed over their entire life. It is about effectively managing physical assets to enable an organization maximize its corporate goals and objectives.

Asset management, in its wider sense, needs to be seen as a contributor to core business resource planning, so as to ensure that physical asset base is aligned with organizational objectives. It is a strategic perspective that takes a long view of assets performance and cost, and considering options in a comprehensive, proactive and informed way. It is driven by policy goals and objectives and relies on systematic assessments of asset performance and cost in making decisions on future actions. Also Then (1997) states that asset management provides the platform and vehicle for:

- defining and quantifying demand emanating from strategic business direction in terms of operational needs of assets and support services to core business activities;
- defining supply in terms of the necessary physical asset base and appropriate service levels from the delivery perspectives and their management over time;
- matching supply to demand over time as a continuous process of maintaining relevance in terms of an appropriate physical resource structure to support the corporate strategic intent.

Simply stated, asset management fulfills a much needed intermediate role between strategic management and operational management in any organization. Representation in asset management should comprise of strategic inputs from senior management staff responsible for strategic planning.

The objective of asset management in this context is to ensure (and to be able to demonstrate) that the assets deliver the required function and level of performance in terms of service or production (output), in a sustainable manner and at a minimum whole-life cost, without compromising health, safety, environmental performance, or the organization's reputation.

Asset Management Process

In the reviewed literature, the Australian models classified assets as inputs to service delivery and identified four main steps which might be described as Asset Management Process. These are:

- Identifying objectives
- Preparing an asset management plan
- Implementing the plan and its programmes
- Auditing and review.

Identifying Objectives

Asset management development process as discussed in the literature reviews in *chapters 2*, should begin with the organization setting broad corporate asset management goals and objectives which should be able to be understood easily and should relate to the quality, coverage, timeliness and cost of asset management outputs. It should also define what services it will deliver in accordance with their corporate plans thus satisfying its stakeholder needs, and should translate the broad goals and objectives into specific service requirements that it plans to deliver, outlining the strategy that is to be adopted.

Preparing and implementing Asset Management Plan

The objective of asset strategic planning discussed in the reviews, is to ensure that strategies implemented in managing an asset portfolio are focused on providing efficient and cost-effective services in line with corporate planning and service delivery strategies. The process represents the translation of the demands and/or expectations of users/customers of an organization into service needs through the preparation of long-term strategies while conforming to legislative requirement in order to determine the optimum operational activities for the business.

The literature review in question has emphasized that there is an increasing need for a forward-looking approach to asset management that will lead to:

- structured and accountable corporate planning
- demonstrable linkages between service delivery and resource planning
- formal capital, maintenance and disposal planning for assets
- the use of appropriate methodologies to manage the demand for new assets
- more effective and innovative ways of delivering services
- private sector participation in the financing, provision, management and maintenance of public infrastructure

The objective of planning, according to the literature, is to ensure that strategies implemented in managing an asset portfolio are focused in providing effective and cost-efficient services in line with corporate planning and service delivery strategies. The Operational Planning process translates the service delivery strategy into specific action plans for managing an organization's assets so as to cost-effectively achieve the organization strategic goals in the long-term. This process consists of the development of four components that are interconnected with each other. These are extensively drawn from the TAM 2000 as given in the subsequent sections and include:

- The Asset Strategy *and its integrated*
 - The Capital investment Strategic Plan
 - The Asset Maintenance Strategic Plan
 - The Asset Disposal Strategic Plan

Asset Strategy

Basically, the literature reviewed has shown that asset strategy is all about getting alignment between an organization's business strategy and its assets, both now and in future years. It enables organizations establish the asset portfolio that appropriately and effectively meets their service delivery requirements. In particular, asset strategy includes (NSWT 2004): -

- developing a good understanding of organization's present assets and determining how they might meet its business needs both now and in future years
- determining how the assets presently perform and comparing that with how the stakeholders want them to perform, again both now and in future years
- determining how to provide the required assets and performance at least cost and predicting these costs in both the short and long term
- investigating how these costs will affect the organization's business strategy in the long term.

Capital Investment Strategy Plan – According the Australian TAM 2000, Capital Investment Strategic Plan aims to provide efficient and effective planning of capital resources by ensuring that there are clear and detailed links between assets and the services and results they support. It applies where the Asset Strategy Plan indicates the need for investment in new assets or significant improvement or upgrading of existing assets

Asset Maintenance Strategy Plan – The Queensland SAM documents shows that Asset Maintenance Strategic Plan aims to proactively manage the risk of the assets becoming unable to support service delivery strategies. The outcome is a more productive and reliable asset portfolio within the constraints of available resources. Maintenance planning involves an analysis of maintenance needs against an organization's service delivery objectives and the organization's priorities (DPW 2006).

Asset Disposal Strategy Plan - An Asset Disposal Strategic Plan involves a detailed assessment of those assets that the Asset Strategy Plan indicates are no longer effectively meeting their service delivery requirements at the lowest long-term cost to the organization. This assists organizations to identify those redundant assets for disposal that might otherwise inhibit efficient and effective service delivery. Asset Disposal planning involves two distinct elements (DPWS 2001):

- The detailed assessment of assets identified as surplus by the Asset Strategy Plan; and
- An analysis of the physical disposal of the assets.

Audit/Review

Audit is a very useful tool in asset management and the entire business process of an organisation. The objective of auditing is to ensure the effective development, implementation and operation of asset management plans which is essential in order to establish a continuous assets management improvement cycle, maintain best industry practice and assess the quality of (NSWT 2004):

- Assets management processes, information systems and data
- Asset management plans
- The implementation of asset management plans

It is essentially an assessment of the organisation's performance with regard to the management of its asset portfolio while critically reviewing the current level of service provided and possible areas of improvement.

In reviewing and evaluating the strategies adopted (to invest in, maintain, re-invest in, or dispose of assets) some key questions need to be addressed: Is the asset supporting the most effective delivery of the service? If so, is the asset performing optimally? To undertake this review successfully, each phase of the asset strategic planning process must be questioned.

Estate Management - Similarly and as earlier discussed in the previous chapter, the principal objectives of estate management are to provide buildings which are efficient and safe and which effectively support organizational activities, and to achieve the maximum benefit from estate as a resource. It seeks to ensure efficient utilization of property as an input resource to the organization's primary function.

Then (1997) observed that Estate Management provides the strategic link between strategic business planning and operational estate management. In the context of any organization or business unit, the focus of estate management is to reconcile the demand for, and supply of, property asset base and associated services essential for the delivery of its core product or services. Simply put, the principal role of estate management is to support the core business of the organization it is serving.

As stated in *Chapter three*, estate management have both strategic and operational perspectives. The process of strategic estate management could start with setting property objectives around which an estate strategy could be formulated. Such objectives must include an assessment of how properties contribute towards the primary task of the organization. Avis, et al, (1989) concluded that in order to manage operational property efficiently, organizations needed to:

- Understand organization's overall objectives
- Establish organizational property requirements and translate them into specific objectives
- Determine how to achieve the property objectives
- Instigate a monitoring system to assess property and property management performance
- Construct an information base to support property asset management and monitoring

In the case of educational institutions, developing an estate strategy will according to HEFCE (2000) require a sufficient knowledge of academic plan as well as financial strategy of an institution. This is termed as a planning triangle and is given in *chapter three (figure 3.8)*.

Facilities Management has got similar concepts and objectives. It encompasses a wide range of activities aimed at supporting the core business of an organization. FM entails the integration of people, technology and support services to achieve an organization's mission. FM operates on the premise that the efficiency of any organization is linked to the physical environment in which it operates and that the environment can be improved to increase its efficiency. Organizations that want to gain the benefits of FM need to adopt a planned approach that takes into account management input, evaluation of options, implementation costs and periodic reviews. Effectively planned facilities and quality support services can create significant business returns. A successful building is thus an amalgam of people, process and space. Understanding the role of buildings and how they can be deployed effectively, in the context of the operations of each individual business, is the essence of facilities management.

Traditionally, Estate Management has had a low profile, playing a largely reactive role as far as business strategy has been concerned. Lyons (2004) recognizes this in his report. Facilities Management, which has grown as an independently recognizable adjunct to Estate Management over the last ten years, has also suffered from this mindset. There is a view that support services, and the corresponding need to manage those service contracts, are not sufficiently important to influence future business planning. The fact that the property and facilities' budgets are often second only in size to the payroll has not always been seen as a reason for essential strategic involvement.

The Link between AM, EM and FM

From the previous chapters however, it can be said that there are clear shifts in focus as the practice of AM, EM and FM gradually matures. It is already discernable from published literature and review of practices that the initial preoccupation with tasks and functions has given way to an emphasis on processes and their management. Then (1997) observed that more recently, the shifts has been towards resource integration with the emphasis on provision of enabling working environment where the issues of people, process and properties are elements of the same problem seeking a common solution.

The concepts of AM, EM and FM are therefore inextricably linked and share the common objective of providing an enabling workplace environment to fulfill corporate objectives. Figure 4.1 illustrates how these practices interrelate. The corporate level is concerned with adequacy of assets as business resource to fulfill strategic objectives. The estate level then interprets this strategic intent in terms of implications on the current operational estate portfolio, i.e. facilities provision. The building level primary concern is with meeting user's requirements on an ongoing basis, while at the same time, minimizing disruptions while taking actions to adjust to the next steady state as a consequent of the strategic response initiated at corporate level.

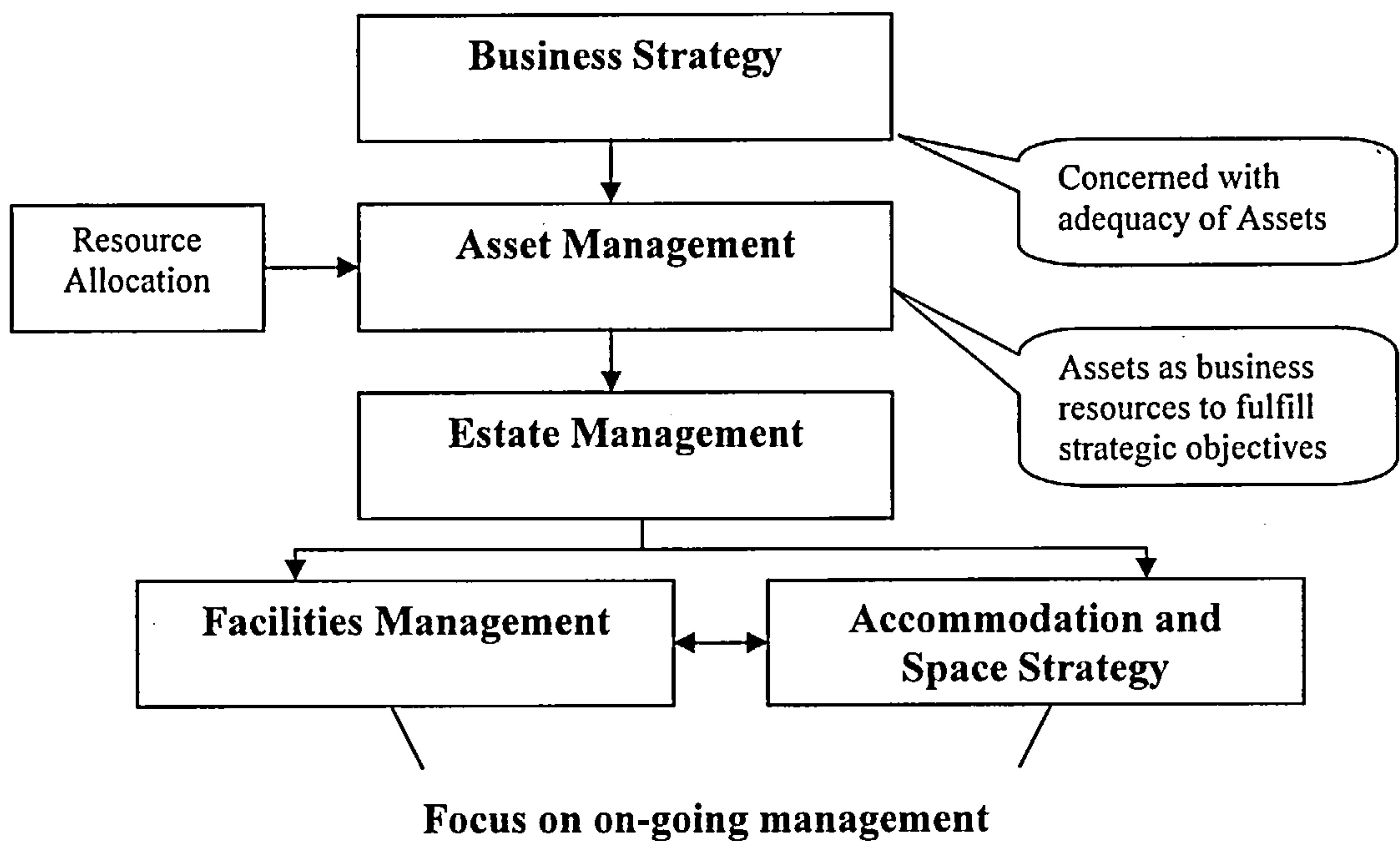


Figure 4.1: Interrelationship of EM, AM and FM

Proactive application of EM, AM and FM practices demands clear strategic direction from senior management. To be effective estate, facilities and asset management should embody strategic, tactical and operational dimensions. The Table 4.1 shows some concepts, tools and issues of EM, AM and FM.

	FM	EM	AM
Concepts	A total management of all services that support the core business of an organization. It involves managing and coordinating the 'people, process and place issues	All facets of use, development, and management of urban land, including sale, purchase and letting of residential, commercial and industrial property	An optimum way of managing assets to achieve desired and sustainable outcomes. It covers the procurement, operational management, maintenance, rehabilitation and disposal of assets such that their use is maximized in regards to their service delivery potentials
Tools and Techniques	Benchmarking; space analysis; maintenance plan; people/skills audit; service provider audit; effective communication; risk management	Strategic/Tactical Planning; Operational Planning; Audit and Review; Risk management; demand management	Strategic/Tactical Planning; operational Planning; Audit & Review; demand management; information; value management, Risk Management. Life-Cycle Cost

Issue in this study	Minor building maintenance; decoration works; telecommunication and IT facilities; floor space allocation and utilization; air conditioning; cleaning; security; vehicle fleet; safety; etc	College land, maps, development layout; valuation, lease & insurance; environmental; landscape & parking; etc	Asset procurement, remodeling, rationalization, reconfiguration; disposal; repairs, maintenance and rehabilitation of assets; assets own, their capacity, age, performance & functionality; physical condition of assets; level of service required; asset data; infrastructure; etc
---------------------	---	---	--

Table 4.1: Concepts, tools and issues of EM, AM and FM:

Whilst specialist knowledge or technical competency is very important to the everyday running of property and estates, asset management, as proposed by Lyon (2004), implies a wider understanding of the part property can play in the delivery of the organization's primary objectives. There are therefore differences between the property/estate management view of assets and the asset management view of property. Asset Management properly lies at the level of corporate resource management. It is a feature of thinking at a strategic level, which means matching future capabilities to a future environment in order to achieve defined outcomes. Asset management therefore aligns itself with strategic resource and ICT management at the business thinking level. Decisions to utilize property assets as an enabler to business planning stem from this level and manifest itself as strategic property management. As Male (2006) puts it: "Strategic Asset Management is a structured and holistic approach to aligning and managing the performance of physical built assets as an organizational resource to meet business objectives and drivers. It is a top down policy drive and bottom-up needs verified approach."

While all the three management methods of EM, FM and AM have been employed, the Asset Strategy Models developed are basically AM-led due principally to the strategic view of the Asset Management as earlier explained. This also fits well with the major issues that need to be addressed in the colleges under study. The next section therefore gives highlights on Asset Strategy.

4.3 Understanding Asset Strategy

Asset Strategy which has been discussed in *Chapter two* can be described as the planned alignment of physical assets with service demand. It is achieved by the systematic management of all decision-making processes taken throughout the life of the physical asset (DPW 2004). The strategy enables organizations to focus on service delivery requirements of the assets rather than on the assets themselves, it also enables organizations to establish the asset portfolio that is most appropriate, effective and efficient in meeting the demands of their service delivery requirement.

The strategy establishes the basic relationships between Service Delivery Strategy and the Capital Investment, Maintenance and Asset Disposal Strategic Plans with how these plans inter-relate. The plan outlines and guides the organization's asset response to its service requirements, through the development of an asset portfolio, risk management strategies and asset performance measures. The strategy identifies any needs or 'gaps' to support services and addresses those, through planned capital investment, disposal or maintenance including replacement and/or upgrading.

For the purpose of this study, Asset Strategy can therefore be described as a long term plan for developing and managing the assets and facilities in an optimum way in relation to the colleges' academic plan and business needs. It is based on an analysis of the assets and facilities, the academic plan, current resources and future opportunities. The strategy will enable the Colleges to:

- Develop the assets and facilities to achieve college goals
- Effectively and efficiently manage physical resources
- Demonstrate that provision, maintenance and development of the assets and related services are consistent with the college's strategic plan, and to secure value for money.

The Asset Strategy is expected to set out the most appropriate long term course of action for implementing asset management policy and thereby supporting the delivery of college strategy. It is the process by which a College can define and determine its corporate objectives, design and formulate the actions required to achieve these objectives, implement the necessary affirmative action, and evaluate the progress

achieved and measure the results. It is concerned with establishing the scope of the college activities and matching these to the environment in which it is required to operate. It is therefore essential that asset strategy is realistic, well thought out, of appropriate detail and has taken into account the views of all relevant stakeholders.

Developing an Interim Asset Strategy Model

The development of Asset Strategy is described by the NSW TAM (2000) policy as the critical stage in organization's strategic planning. It is seen as a vehicle by which an organization matches its asset portfolio to its service delivery requirements.

This study has developed an asset strategy model which will help improve the effectiveness and efficiency of service delivery in the Nigerian Federal Colleges of Education, for their overall goal attainment within the limited resources available. It provides an avenue through which various stakeholders within each College can appreciate and support the need to develop and implement an asset strategy for their institution

Effective asset management requires an understanding of the Colleges' business and the demands of its operations. The Asset Strategy policies of each College can only follow the strategic plans of that College as a whole, because successful businesses are those that not only reflect on the past but look strategically into the future. Hamel and Prahalad (1994) argue that a business needs to develop insight of how their business might operate in the future with a view to getting there first. Any future plan in the Colleges must include a careful analysis of what assets the business needs, where they should be located and of what type. Asset strategy should therefore align the vision of College overall strategic planning process, the management team and the asset management team. It should:

- Provide the management team with a picture of the complex questions relating to their assets for which they have responsibility
- Enable the management team to more clearly identify and quantify the best investment opportunities to enable the college to efficiently meet its stated objectives

- Enable the management team to predict future needs with great accuracy and hence create more robust academic activities
- Ensure assets meet the changing academic policies and programmes in an effective and efficient manner

TAM 2000 suggests that an Asset Strategy will “enable agencies to establish the asset portfolio that most appropriately, effectively and efficiently meets their service delivery requirements”. The development of an asset strategy is a critical stage in the college strategic planning. Johnson and Scholes (1993) define strategy as “the direction and scope of an organization over the long term: ideally, which matches its resources to its changing environment and in particular its markets, customers or clients so as to meet stakeholder expectations”.

To develop an asset strategy, TAM 2000 indicates that there is the need for a participative, problem solving, coping, and continuous process, which identifies asset needs, examine gaps between existing and required assets and identify factors responsible for such gaps. Therefore, efforts to involve and empower staff, students and other stakeholders in the change process are necessary. Thus a participatory approach should be used in appraising the problem, identifying the strategic needs, and working out the process of solving the existing problems.

The participatory approach is adopted based on the assumption that the major source of knowledge is understood to be people themselves, based on their own life experiences, and on the basis of their own involvement in the study of the situations surrounding them. The methods for developing the strategy should be in such a way that people themselves will think, reflect on the problems at hand, build capacity for critical thinking and debate, and to develop in themselves, confidence as well as the commitment to act for the desired change.

Although the asset strategy developed involved much of the identified stakeholders and set long-term targets, nonetheless, the production of the strategy document is not an end in itself, thus it is unthinkable to assume that everything is completed once a strategy is developed. The strategy also has to be rooted in and supportive of the

college's overall corporate plan, and must take account of the financial resources available. Johnson and Scholes (1993) rightly observed that:

“Since strategy is about the long-term direction of an organisation, it is typically thought of in terms of major decisions about the future. However, it would be a mistake to conceive of organisational strategy through one-off major changes. The strategic development of organisations is better described and understood in terms of continuity.... Once an organisation has adopted a particular strategy then it tends to develop from and within that strategy, rather than fundamentally changing direction”.

The above statement is particularly important because of the need to plan an asset strategy to be flexible enough to allow for continuity over a period of time. HEFCE (2000) report noted that changes to an asset portfolio could be necessitated either due to changes required in the form of the asset (utilization, location, capacity or functionality) or as a result of changes to service delivery requirements or budget allocations. The asset strategy is expected to define actions required to respond to these changes and direct the detailed development of the college capital investment, asset maintenance and asset disposal strategic planning. Planning a dynamic and flexible strategy could permit these changes to be catered for without necessarily affecting the overall plan.

In developing an asset strategy, Stewart (1999) suggests that it will be necessary to:

- prepare an inventory of assets, including details such as floor area, the date of construction/refurbishment, category of use, type of construction, etc
- confirm the level of service required by building users and the cost they are prepared to pay for that level of service
- develop a long term plan, including annual maintenance costs and estimated dates and costs of future refurbishments and replacements
- identify and assess areas of risk and develop strategies and costs to mitigate those risks
- explore the best methods of delivering the asset management strategy, using in-house resources, external resources or both, and how best to procure these services
- set key performance objectives to enable the performance of your assets to be measured

- determine how funding required for these programmes will affect the organization's performance.

4.4 Process of Developing the Model

Based on the above and also the interrogation of literature in the previous chapters, and particularly gaining insights from the Australian Asset Management framework in figure 2.3 and that of the IAM in figure 2.4 therefore, eight stages had been identified for developing the asset strategy interim model as given in figure 4.3. These eight stages as explained in the next sections reflect the said frameworks in figures 2.3 and 2.4, as well as the linkages between AM, EM & FM in figure 4.1. The developed stages therefore constitute the main components of the interim asset strategy model given in figure 4.4. The interim model was then tested and later modified in the course of the field work in order to properly contextualize it and make it adoptable by the colleges. Stakeholders in each College are expected to develop their own individual asset strategy, taking into consideration, their local peculiarities, and using the asset strategy development guidelines (process) developed for the purpose.

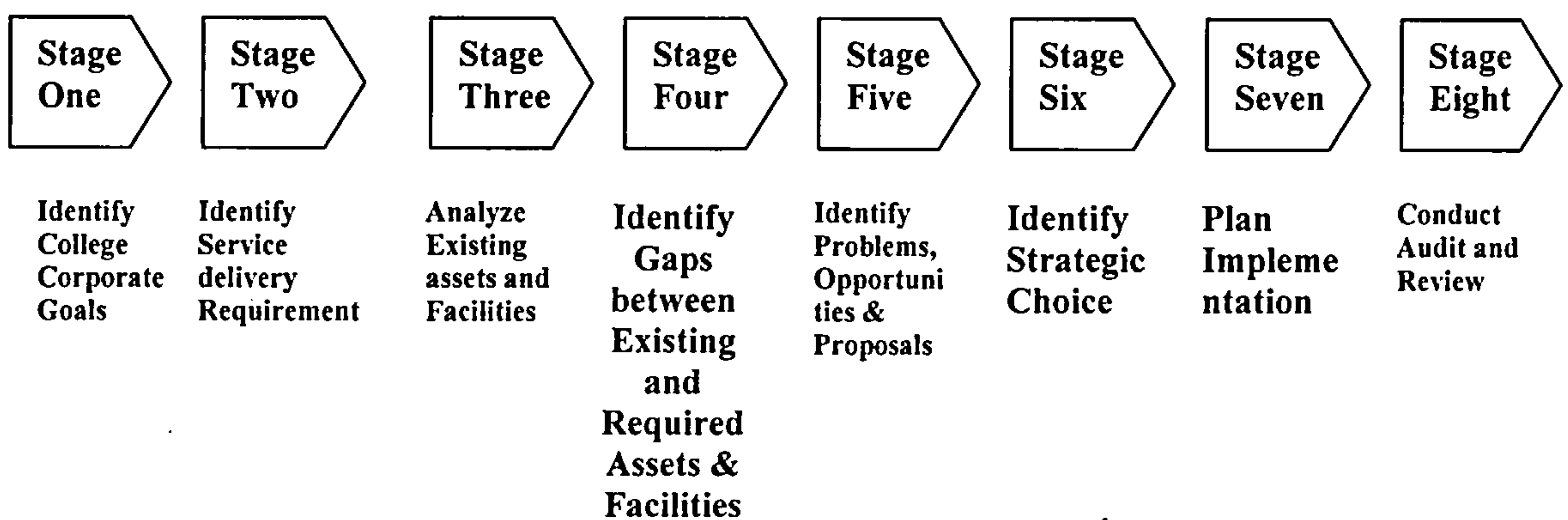


Figure 4.3 Stages in Developing the Asset Strategy Model

As earlier discussed, Asset Strategy is basically aimed at aligning the College's business strategy and its physical assets, both now and in future years. It encompasses two interacting components:

1. A strategic component focusing on the medium and longer term and involves decisions on appropriate investment in physical assets to meet stakeholder needs and service delivery requirements. In the case of this study, the Asset Strategy

identifies College corporate goals, service delivery requirements and needs for physical assets. It also challenges these needs and the use of physical assets to deliver services, and seeks alternatives that may make service delivery less dependent on physical assets, if that would subsequently provide greater value for money. This component is represented by the first two elements of both the Strategy Development Stages of Figures 4.3 and the Interim Model (Figure 4.4), which are also in tune with the strategic planning components of the Australian framework in Figure 2.3 and the IAM Asset Management Plan in Figure 2.4. This strategic component is therefore dealt with at the College Council and Management Board levels in line with the asset management position as depicted in Figure 4.1.

2. An operational component focusing on the ongoing management of physical assets and facilities over the short to medium term time horizon, within an allocated budgetary framework set at the strategic level once investment decisions in physical assets have been made. Typically the time frame would be less than one year up to three years. It involves the management of the estate and facilities that support the core business of the college, i.e. teaching and learning. The locus of the operational element will be, for example, at or below estate level within the college, reflecting Figure 4.1. This operational component is again derived from the literature, particularly from Figures 2.3 and 2.4, which largely informed the development of the third to the eighth stages of the Strategy Development process in Figure 4.3 and subsequently the corresponding components of the Interim Model in figure 4.4.

How these various stages of the strategy model are developed as in Figure 4.3 are therefore discussed as follows:

Stage One – Identify College Corporate Goals and Objectives

In this study, the principal objective of asset strategy is the alignment of physical assets with college corporate objectives. Therefore the first segment of the asset strategy should be the College Corporate Goals and Strategic Objectives. This is in line with the literature on asset management discussed in chapter two, which shows that asset management process should begin with the organization setting broad asset management goals and objectives that is in tune with its own corporate objective, and which should be able to be understood easily; relate to the quality, coverage,

timeliness and cost of asset management outputs. Of particular interest is the IMM framework in Figure 2.4 which indicates that the setting of the corporate Asset Management Direction as the first activity in developing and using Asset Management Plans. This involves identifying corporate plans and business objective; stakeholder needs and expectations; and legislative requirements. These stand points also satisfy the Australian Asset Management Process framework given in Figure 2.3. Similarly it has been shown in *Chapter three* that both EM and FM are about supporting the core business of an organization. A fundamental aspect of EM, FM and AM is their function as a link between the primary business functions and secondary support services within an organization. Understanding the corporate objective of the College should therefore be the first step in developing an asset strategy.

Each College is responsible for developing its own asset strategy within the context of its corporate objectives and academic plan. The strategy should be based College corporate goals and objectives, and must be part of and flow from the College Development Plan and consist of a separate document consistent with, and designed to further, the strategic objectives of the college. The following factors are expected to be reflected and guide the development of the first segment of the strategy which also constitutes the first component of the Interim Asset Strategy Model given in Figure 4.4:

- College corporate objectives
- Stakeholder needs
- Decree establishing the college
- Academic plans

Stage Two – Identify Service Delivery Requirements

The next crucial segment of the asset strategy as discussed in the previous chapters is the service delivery requirements. Asset strategy has been described in *Chapter two* as the planned alignment of physical assets with service demand. The strategy enables organizations to focus on service delivery requirements of the assets rather than on the assets themselves, it also enables organizations to establish the asset portfolio that is most appropriate, effective and efficient in meeting the demands of their service delivery requirement. Assets should align effectively with and support organizational

business needs for the short and long-term (NSWT 2004). It was also argued in *Chapter three* that Strategic Asset Management should aim to provide an appropriate fit between the core business needs of the client and the provision of Asset Management. These therefore demonstrate the importance of linking service demands to the provision of assets. This segment, like stage one, is also a feature of strategic thinking and is in tune with Figures 2.3, 2.4 and 4.1.

Here, the College should be clear, through a process of internal consultation based on the overall strategy for the College, of what the asset strategy will deliver; the strategy should be developed in close consultation with representatives from the academic community, finance, estates and planning. This has the benefit of focusing subsequent debate and providing a framework against which different options can be assessed. The service delivery objectives, as shown in the literature review, should be based on a needs analysis and a review of how services are currently being provided. It should:

- define the scope, standard and level of services to be provided;
- assess the methods of service delivery and the resources needed, including requirements for the use of assets; and
- consider methods of containing demand by using demand management techniques. This may involve reducing the need for the service (for example, by combining it with another service, or by dealing with the situation that causes the service to be sought).

This segment of the strategy development is reflected as the second component of the Interim Model in Figure 4.4 and should include information relating to:

- Current and projected numbers of academic programmes
- Current and projected student and staff population
- Academic and other space standards
- College budget
- Statutory requirements

The service delivery segment should also contain elements of Estate Management (EM) and Facilities Management (FM) that forms part of the service delivery requirements of the College. While citing HEFCE (2000) estate strategy, the literature

review in *Chapter three* has indicated that developing an estate strategy will require a sufficient knowledge of academic plan as well as financial strategy of an institution. This is termed as a planning triangle as shown in Figure 3.8.

The service delivery objectives for the assets/facilities should be clear and, where possible, their attainment capable of being measured. These objectives should demonstrate what the assets are expected to deliver in terms of the College Development Plan. As far as possible, and within the period covered by the college Development Plan, they should be set out in a bullet-point form of delivery in the Specific, Measurable, Achievable, Relevant and Timed (SMART) format. Setting objectives in this way not only assists in option appraisal but will also assist colleges in the process of post implementation review and analysis of how well the objectives have been met.

The Asset Strategy should look at requirements and set out aims and objectives for the shorter and longer terms. The principal aim should be to rationalise the College assets, to provide the space and facilities required to meet the College strategy over a period of 5-10 years. Different levels of objectives exist which may be classified as ultimate, intermediate and immediate, as defined below:

- **Ultimate** objectives are usually framed in terms of longer term (i.e. more than three years), strategic or 'high-level' variables. Annual reports or statements of Government policy can be used as a source of such objectives.
- **Intermediate** objectives are a step down from ultimate objectives and are short term i.e. within the three year planning period covered by the College Development Plan. These need to be met if the ultimate objectives are to be achieved. Generally, intermediate objectives should be measurable and their contribution to ultimate objectives clear.
- **Immediate** objectives are usually directly concerned with the outputs of a specific project and require to be met if the intermediate objectives are to be achieved. These objectives will normally be measurable and, to a greater extent, within the control of those responsible for delivery.

Ultimate objectives can be thought of as the underlying principles, aims or goals of the Asset Strategy flowing from the Development Plan. These longer term objectives are often the most difficult to define in SMART terms as they represent a College's aspirations or goals. Intermediate and immediate objectives which are achievable in the three year strategic planning cycle should be defined in SMART terms and included in the Asset Strategy.

Stage Three – Analyze Existing Assets and Facilities

In this segment, and with the specification set out as to where the College wants to be in terms of its assets, the next process is to assemble the appropriate data on the existing assets. Defining an appropriate asset portfolio, according to TAM 2000 discussed in the literature review in *Chapter two*, is essential to the overall development of an Asset Strategy. The process of developing an asset portfolio should be undertaken in the context of overall resource management and service delivery. This is an operational planning component of the Asset Strategy as earlier discussed, and it is in line with the Australian framework in Figure 2.3 as well as the IAM framework in Figure 2.4.

One of the early tasks in preparing an Asset Strategy according to the literature is for an organization to prepare an inventory of assets, including details such as the date of construction/refurbishment, floor area, category of use, type of construction, etc. It is dealt with at the estate and facilities management levels as in Figure 4.1. A range of information can be collected, which include:

- Physical condition of assets
- Location of assets
- Use
- Size
- Age
- Value
- Tenure
- Functional suitability
- Space utilization
- Running cost

The list is not exhaustive, nor is it suggested that all items should be included in the final asset strategy document. It would be more appropriate for the information to be

in a separate document or in appendices to the asset strategy. This segment is correspondingly given as the third component of the Interim Model in Figure 4.1. In developing this segment, other information such as asset register, valuation reports, FM contracts, tenancy agreement documents, etc will also be required.

Stage Four – Analyze Gaps between Existing and Required Assets and Facilities

This phase of developing the model involves the comparison of information assimilated on the existing facilities with the effective performance specification for facilities that are developed by analysing the College's strategic and asset objectives. This is also part of the operational planning component of the strategy and is in line with Figures 2.3 and 2.4. The analysis reveals the "gap" between demand and supply. Articulation of these gaps provides a series of problems or facility shortfalls together with opportunities, whether financial, physical or operational. The resulting schedule of problems and opportunities provides more detailed parameters for developing Strategy options. Key headings by which the gap may be identified could include(DPW 2004):

- Development opportunities;
- Asset condition;
- Functional suitability;
- Refurbishment/adaptation;
- Space utilisation; and
- Space need.

Having identified the current assets held and what assets are likely to be required in the future, a 'gap analysis' can be undertaken to identify the necessary adjustments to be made to the asset base. Successful analysis as shown in the literature review is ensured by (DPW 2004):

- having available all relevant information on existing assets
- knowing the trends in demand
- having a clear strategic direction and objectives
- applying appropriate planning tools and methodologies

This segment which is at the Estate/Facilities Management levels as in Figure 4.1 will also outline any likely future changes that will affect the overall performance and asset needs. These data will enable the College to work out the contribution of each asset, and how it will support the college's strategic aims and objectives. A matrix

table could be used to compare the elements of asset performance. Such a matrix can be used to focus investment and as a performance target for the College.

It may be appropriate to use this section as a long-term 'wish' list and then focus on aspects that are achievable in the shorter term within the resources available. They should be prioritized with reference to academic need and the strategic objectives. This leaves scope for more ambitious plans should money become available or circumstances change.

In developing this segment, which correspondingly is the fourth component of the Interim Model in Figure 4.4, the following, will among others be required;

- Asset Register
- Asset condition survey report
- Current/Projected populations figures
- Capital/Maintenance Plans
- Current/Projected Academic Programs
- Asset disposal plans

Stage Five – Identify Problems, Opportunities and Proposals

This segment is also reflects from the literature review chapters and can be undertaken in three distinct sections: problems, opportunities and proposals. However, one of the strategies developed by HEFCE (2000) linked the three together and produced a diagrammatical representation of the three items. It helped to see the issue through from the problem, to the opportunity and proposal stages on each individual building, rather than looking at the problems of the institution as distinct from its opportunities and consequently its proposals. There is no right or wrong format to follow; however, Colleges should ensure that problems, opportunities and proposals are all covered within their asset strategy. It should be an analysis that highlights the shortfalls of the assets. It looks for options to address these shortfalls, and results in a proposal to rectify the situation.

A variety of formats can be adopted to represent problems, opportunities and proposals, colleges may wish to illustrate this section with tables and flowcharts, or alternatively to present the narrative asset by asset, or problem by problem. The development of this segment requires information regarding the following as reflected in the Interim Model of Figure 4.4:

- Staff Structure/Skills and development plan
- College Budget
- FM services
- Revenue generation plan

Stage Six – Choose Strategic Options

Having established the problems and opportunities associated with the existing assets and facilities, together with the performance specification of requirements, this segment is where the option appraisal, which is a key part of developing the asset strategy, is carried out. It pulls together all of the considerations outlined in the previous sections of this process, and involves developing a range of options aimed at addressing shortfalls, reducing operational costs and providing facilities which meet the physical and functional needs of the College, both now and for the projected future. The asset strategy should include an appraisal of the high level strategic options open to the college to meet its estate objectives. Normally this would include:

- a ‘do-nothing’ or ‘do minimum’ option to set the base position against which other options may be judged;
- a ‘ceiling’ option to examine, for example, moving the entire college to another site;
- mid-range options which may include, for example, consolidation to one or more sites, where the college is split across a number of sites or some form of reconfiguration or remodeling of the assets.

Information that will normally be required in developing this segment includes the following:

- NCCE Guidelines and standards
- Funding schedules
- Statutory requirements
- Non asset Solutions

Stage Seven – Develop Implementation Plan

In this segment, having refined, reviewed and appraised the full spectrum of potential options and solutions, an implementation framework for the resultant preferred option, in the form of discrete sub-projects and programmes is necessary. Whilst detailed project specifications are beyond the remit of a strategic document, outline project parameters, associated costs, financial implications and a logistical critical

path indicating the inter-relationship of tasks should be used to provide the implementation overview for the preferred option. This is very much in line with the “Implement the AMP” component of the IAM Asset Management Development Plan in Figure 2.4. It is important that the preferred option should be capable of implementation. The asset strategy should include a provisional strategic programme for implementation and set out specific tasks or milestones which need to be undertaken with an associated timescale.

The Asset Strategy should include a realistic assessment of the levels and sources of funding available to finance the preferred options. If necessary, it should also highlight shortfalls. If there are insufficient funds, the asset strategy should highlight what impact this will have upon the fulfillment of the implementation plan, indicating which projects would be delayed or postponed and their impact on the strategic objectives. The final strategy should also be widely understood and accepted within the college and mechanisms should be put in place to monitor and review progress with implementation. These may include:

- Planning – the planning implications of the Asset Strategy should be considered.
- In many cases it will be appropriate for a meeting to be held with the local planning authority to discuss the implications of the strategy. The timing of any relevant planning applications will also need to be considered;
- Feasibility Study and Scheme Design – the feasibility study will examine in more detail the design and cost implications of the preferred options. External professional advice may be sought to undertake this task and to advise on a suitable route for procurement;
- Building Regulation Approval/Tender Period;
- Marketing and Disposal of Surplus Land; and
- Contract Procurement.

The programme would be set out in terms of feasibility, not a detailed plan. Information that will be required in developing this segment which mirrors Figure 2.3 and which is also reflected in Figure 4.4 will among others include the following:

- Capital Investment Plan
- Maintenance Plan

- Disposal Plans
- Asset Register
- Human Resources plan

Stage Eight – Conduct Asset Audit and Management Review

It is important to ensure an effective development, implementation and operation of asset management plans. This is therefore the objective of the Audit/Review segment. This is emphasized in both Figures 2.3 and 2.4. Auditing, according to TAM 2000, provides an ongoing assessment of how an organization is performing with regards to its approach to the management of its assets and facilities. The audit and review functions also include a critical look at the current levels of service provided by the asset stock and the areas of improvement in owning and operating the assets. This segment is reflected as the eighth main component of the Interim Model in figure 4.4, and is shown to link up with and provide necessary feed back to all other components.

The audit should be structured to identify:

- The current status of asset management.
- Appropriate service level required by the business units and assets.
- The gap, and the priority or criticality of the gap.
- The improvement program:
 - Tasks required.
 - Costs.
 - Benefits.
 - Timetable

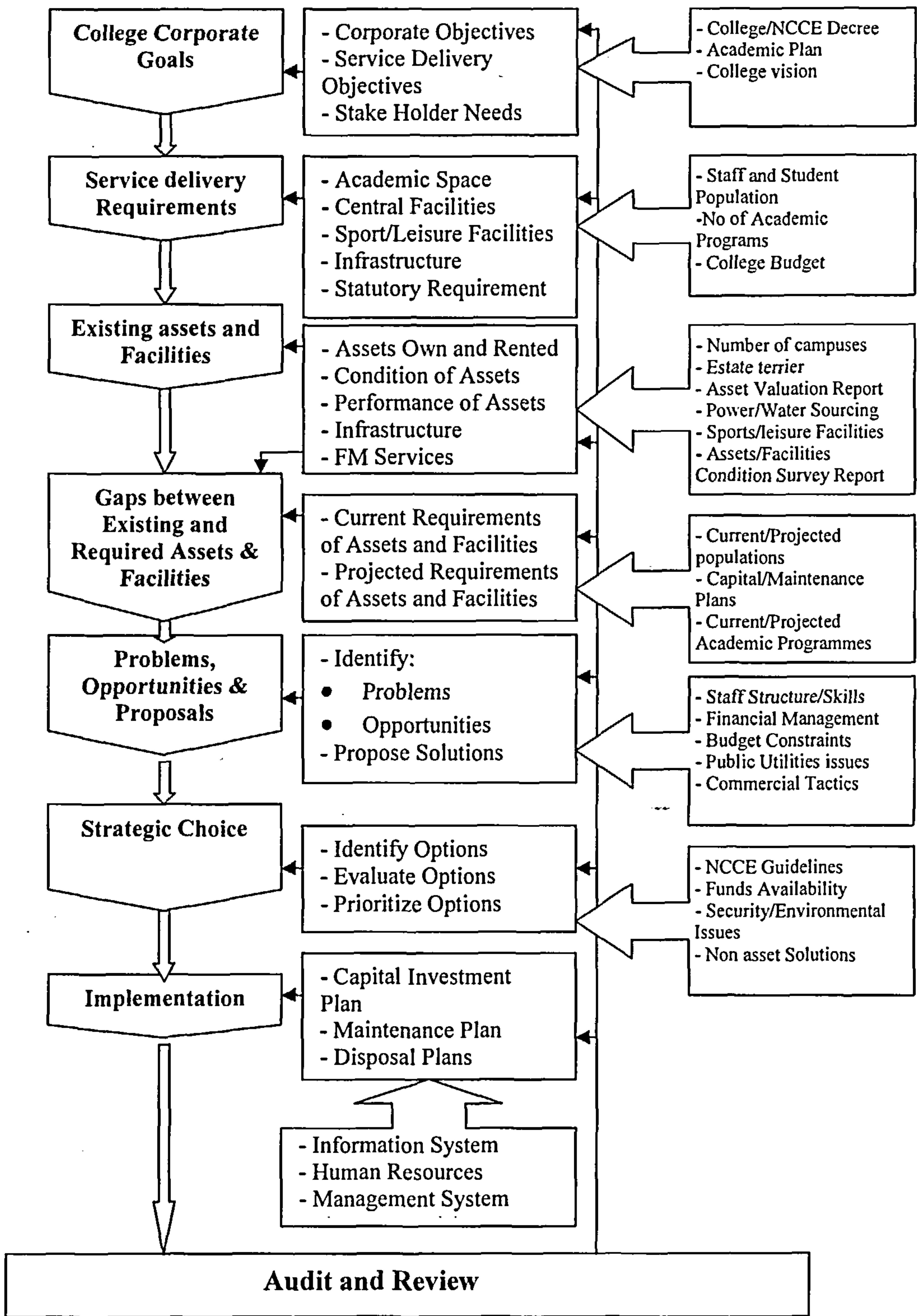


Figure 4.4 Interim Asset Strategy Model

4.5 Conclusion

The Nigerian federal colleges of education can effectively develop and manage their assets and facilities in a way that ensures efficiency and value for money, if they have an asset strategy. The strategy is a long-term plan for developing and managing assets and facilities in an optimum way in relation to the college's academic plan and business needs.

Interim asset strategy model had been developed, based on the interrogation of literature in estate, facilities and asset management fields. The model was found to be very relevant in the course of the field studies and stake holders made useful inputs for its review. Development of modified model and requisite guidelines (process), with active participation of all stake holders during the field studies are discussed in the subsequent chapters.

The field work processes and appropriate research methodologies that will be applied in the field are therefore discussed in the next chapter.

CHAPTER FIVE

RESEARCH METHODOLOGY

5.1 Introduction

Traditionally, the essential feature for research for a doctoral degree (PhD), according to Fellows and Liu (1997), is that “the work makes an original (incremental) contribution to knowledge”. This research therefore has synthesized and analyzed existing theories, ideas and findings of other researches in seeking to provide new insights into management of Education infrastructure, with a view to proposing management strategies that will help bring about improvements in the management of assets in Nigerian Federal Colleges of Education.

The chapter is presented in two main sections. The first section examines the underlying principles of the research process. Those principles include the various types of research, its context, and the effects of knowledge, experience and bias. The various types of data, its collection and analysis are also identified. The second section builds on the first and presents the method developed for this study and demonstrates how it satisfies and reflects the established theory of research.

5.2 Research Design

To research, according Webster (1985) is to search or investigate exhaustively. It is a careful or diligent search, studious inquiry or examination especially investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts or practical application of such new or revised theories or laws, it can also be the collection of information about a particular subject.

Design in this context means the overall configuration of the research. What kind of evidence is to be gathered from where and how it is interpreted in order to satisfy the research objectives? ‘Knowledge can help to recognize which designs will work and which will not and to adapt designs according to the constraints of different subjects or

knowledge structures' (*Easterby-Smith 1994*). The key issues underlying any research design are:

- Degree of involvement - is the researcher independent or involved
- Size - will the research involve large samples or small numbers?
- Approach - will the research attempt to test existing theories or will it aim to generate new theories?
- Style - will the research be based upon experimental or fieldwork methods
- Induction - will the research attempt to verify or falsify

Degree of involvement means how distant or independent of the phenomena being observed can the researcher remain. The traditional view is that independence must be maintained. The size of the sample is dictated by, or dictates to the choice between cross-sectional or longitudinal design. Cross-sectional design involves selecting different organizations and investigating how other factors vary across them. This approach tends not to explain *why* correlation exists. It has the added disadvantage of eliminating all of the external factors, which could possibly have caused the observed correlation. Longitudinal studies focus on organizations over a long period of time. The research focuses on events in a broader context by gathering time series data over periods of time significantly longer than the immediate focus. This approach generates patterns of action, which can help to explain what has happened and why it happened during the period of the study.

The approach determines what comes first, theory or data. Starting with a theory or hypotheses, the researcher will confirm or refute that theory. This method provides an initial clarity about what is to be investigated and hence information can be gathered quite quickly and efficiently. The results however can be quite trivial, confirming only what is known already. Worse still, if the results are inconclusive or negative, the approach will provide little explanation as to why. By contrast, data can be used to generate grounded theory. This is achieved by looking at the same kind of event in different settings or situations. The grounded theory should be sufficiently analytic to enable some generalization to take place but at the same time it should be possible to relate the theory to actual events. The grounded theory approach is good at providing both explanation and new insights.

Experiment, in this context, involves assigning subjects to either an experimental or a control group. The experimenter then manipulates conditions for the experimental group in order to assess their effect in comparison with the control group who are subjected to no unusual conditions. The alternative to experiment, fieldwork, is the study of real situations. This will probably mean becoming absorbed into an organization in order to understand its culture. Induction suggests that however much data is obtained in support of a theory; it will never be possible to reach a conclusive proof of the truth of that theory. The way out of that conundrum is to look for evidence that will disconfirm or falsify the theory. Failure to achieve falsification may in itself strengthen the theory. Whatever research approach is selected, it must be appropriate to the nature of the study, both in terms of theoretical positions and the subject under investigation.

In designing a research methodology it is necessary to identify the aims of the research, describe the problem or purpose of the inquiry, and the required format of the conclusions (Gill and Johnson, 1997).

This research study was aimed at investigating the situation in respect of physical assets in the Nigerian Federal Colleges of Education, including the level of knowledge of these facilities by the colleges and how they are managed, with a view to developing management strategies that will ensure an effective and efficient management of these important resources. This research is therefore directed towards theory and framework building. The nature of the research strategy employed should reflect these aims by examining the following elements of research theory:

- Research orientation.
- Sampling the population.
- Data collection methods.
- Data analysis techniques.

The theoretical basis of each of these issues will be closely examined in the following sections, in order to devise an appropriate research methodology.

5.2.1 Research Orientation

The Concise Oxford Dictionary defines research as “the systematic investigation into and study of materials, sources, etc. in order to establish facts and reach new conclusions”. And research methodology has been defined by Stuman (1997) as “a generalization of techniques and a concretization of philosophy”.

Research methods are variety of techniques that people use when studying a given phenomenon. They are planned, scientific, and value-neutral. They are deliberately employed in a way that is designed to maximize the accuracy of the results.

The aim of any research study is to simplify reality, allowing a number of interrelated variables to be mapped together showing their over all effect (Martin and Turner 1986). There are various ways of conducting research. Cohen et al, (2000) for instance identified three broad ‘categories’ through which a study could be conducted. These are (a) scientific and positivistic/quantitative methodologies; (b) naturalistic and interpretive/qualitative methodologies; (c) critical methodologies. The different approaches are deemed complementary rather than competing against each other.

Positivist/Quantitative Research

Positivism as an approach to research is driven from an acceptance of natural science as the paradigm of human knowledge. According to Cohen, et al, (2000), it presupposes the methodological procedures of natural science can be directly applied to the social sciences. The philosophical basis of positivism is ‘objectivity’. They claim that the social world exists and can be understood as it is. The positivist approach is essentially deductive, intended to ascertain or verify causes and relationships between phenomena. Data for this type of research is usually structured, concise, explicit and therefore quantitative. It is mainly concerned with investigating things, which we could observe and measure in some way. Such observation and measurements can be made objectively and repeated by other researchers. Positivist approach is more concerned with questions about: How much? How many? How often? To what extent?

Quantitative research is most commonly encountered as part of formal or conclusive research but is also sometimes used when conducting exploratory research. Quantitative research techniques are part of primary research and differ from qualitative research in the following ways (Vulliamy et al, 1990):

- The data is usually gathered using more structured research instruments
- The results provide less detail on behaviour, attitudes and motivation
- The results are based on larger sample sizes that are representative of the population,
- The research can usually be replicated or repeated, given its high reliability; and
- The analysis of the results is more objective.

The most common quantitative research techniques include:

- Observation technique
- Experimentation
- Survey technique

Quantitative research methods were originally developed in the natural sciences to study natural phenomena. Examples of quantitative methods now well accepted in the social sciences include survey methods, laboratory experiments, formal methods (e.g. econometrics) and numerical methods such as mathematical modeling.

Interpretive/Qualitative Research Approach

Interpretive paradigm is particularly a phenomenological approach to inquiry, according to Cohen, et al (2000), is a perspective that advocates the “study of direct experience taken at face value; and one which sees behaviour as determined by the phenomena of experience rather than by external, objective and physically described reality”. Qualitative research emphasizes the individual's subjective experience, which typically seeks to understand and describe an event from the participant's perspective. Mertens (2005) explain that in a Qualitative approach, the focus is on understanding how individuals create and understand their own life spaces.

This approach denies the existence of an objective reality: what is important is 'reality as people perceive it, experience and interpret it'. Maso (2001), suggests that although in terms of common-sense thinking, people have only "a more or less personal, fragmentary, restricted, often inconsistent, and partly indistinct knowledge of the world, it is sufficient for coming to terms with this social reality". This is so because, according to Seidman (1991), the social world is itself an inter-subjective world, and because individuals' knowledge of it is in various ways socialized.

Interpretive (Qualitative) research is concerned with developing explanations of social phenomena. It aims to help us to understand the world in which we live and why things are the way they are. It is concerned with the social aspect of our world and with finding the answers to questions which begin with: why? How? In what way? It is concerned with the opinions, experiences and feelings of individuals producing subjective data.

Based on his research experience in Africa, Stephens (1998) argues that it is within this research paradigm that 'a more suitable way forward' could be found. He favors a qualitative methodology in addressing a culturally sensitive research problem because:

1. It focuses on meanings and attempts to understand the culture of those being studied, which makes researcher's work as far as possible in natural settings';
2. It strives to generate hypotheses and theories from the emerging data, rather than testing preconceived hypotheses;
3. It involves the ongoing collection of data through its focus on the process of social interaction, instead of collecting data at discrete points in the research process;
4. It is holistic, which attempts to provide a contextual understanding of the complex interrelationship of causes and consequences that affect human behavior. This permits research to infuse a wide range of specific techniques, even within one research project.

Actions and meanings are socially and subjectively constructed, and are dependent upon the individual actors' perceptions and beliefs, which is why a qualitative study is

more likely to produce a deeper understanding of the situation in a particular cultural setting. Qualitative research techniques opined Darlington (2002), are part of primary research and differ from quantitative in the following ways:

- The data is usually gathered using less structured research instruments
- The findings are more in-depth since they make greater use of open-ended questions
- The results provide much more detail on behaviour, attitudes and motivation
- The research is more intensive and more flexible, allowing the researcher to probe since s/he has greater latitude to do so
- The results are based on smaller sample sizes and are often not representative of the population,
- The research can usually not be replicated or repeated, given its low reliability;
- The analysis of the results is much more subjective.

Because of the nature of the interaction with respondents, the training and level of expertise required by the person engaging in the direct communication with the respondents must be quite high. The most common qualitative research techniques include:

- In-depth interview
- Focus group
- Projective methods
- Case study
- Pilot study

Critical Research Methodology

Critical research methodology approach argues Haralambos and Holborn (1991), aims 'to be critical of society in order to facilitate change'. Critical research goes beyond 'appending critique to an accumulation of "fact" or "theory" gathered via some mechanical process, rather it denies the (literally) objective status of knowledge'. The approach does not believe that the 'truth' can be discovered using the appropriate quantitative or qualitative methods. It rather posits that 'knowledge is a process' in which we move towards understanding the social world. Knowledge is incomplete, fragmented and changing because the social world is dynamic and constantly changing.

5.2.2 Sampling the Population.

A sample is a finite part of a statistical population whose properties are studied to gain information about the whole (Webster, 1985). When dealing with people, it can be defined as a set of respondents (people) selected from a larger population for the purpose of a survey.

A population is a group of persons, objects, or items from which samples are taken for measurement for example a population of engineers or professors, books or students. To draw conclusions about populations from samples, we must use inferential statistics which enables us to determine a population's characteristics by directly observing only a portion (or sample) of the population. That is what is referred to as sampling. A sample can therefore be defined as a portion of the units/elements in a population which will provide all information necessary for tackling the original research problem (Dane, 1990; Gill and Johnson, 1997).

The fact that we cannot study everyone everywhere doing everything raises the need for sampling. Punch (2000) states that sampling decisions include those relating to whom to interview, which events to observe and in which settings to carry out a study.

All researchers attempt to draw general conclusions from fragmentary data about a particular population. Sampling is the process of examining a representative number of parts of a population in order to gain an understanding of some feature or attribute of that population. Any knowledge thus gained can only be an estimate of the characteristics of the whole population, the level of accuracy of that estimate depending upon the size of the sample, how it was selected and the extent of variability in the population.

Sampling logic assumes the sample to be representative of the whole population and on the basis of that assumption, confidently forecasts the behaviour of the whole population. It is useful for determining frequency of events or rates of incidence. Case studies are not an appropriate technique for establishing rates or frequencies. If this type of data is required, survey is a more appropriate technique.

The quantitative researcher uses statistical tools designed to provide a representative sample of a known population but all statistical sampling is subject to experimental error and results are given in terms of probability. Qualitative researchers usually use small purposive samples from within a context which are studied in depth.

Descombe (1998) observe that there are three primary kinds of samples: the convenience, the judgement sample, and the random sample. They differ in the manner in which the elementary units are chosen.

The convenience sample - A convenience sample results when the more convenient elementary units are chosen from a population for observation.

The judgment sample - A judgment sample is obtained according to the discretion of someone who is familiar with the relevant characteristics of the population.

The random sample – This may be the most important type of sample. A random sample allows a known probability that each elementary unit will be chosen. For this reason, it is sometimes referred to as a probability sample. This is the type of sampling that is used in lotteries and raffles. For example, if you want to select 10 players randomly from a population of 100, you can write their names, fold them up, mix them thoroughly then pick ten. In this case, every name had an equal chance of being picked.

5.2.3 Data Collection Methods

All research follows the same process of data collection, analysis and presentation. Taken globally, data can be either qualitative or quantitative each type having its own methods of collection and analysis. When qualitative data is in the form of words (it could also be still or moving pictures) the words are based on observation, interview and documents.

There exist three main types of quantitative research data: nominal, ordinal and interval. Nominal is the labeling of different categories such as professions, gender, and age groups. Ordinal results from the classification or ranking of data such as that produced on Likert type scales. Ranking means arranging in order, with regard to

some common aspect. It displays the order or sequence, but the size of the rank intervals is unknown and can only be assumed to be unequal. Interval is the difference between agree/disagree definable points.

Data can also be described as being primary or secondary. Primary data are collected directly from respondents and would include any body language that may be present. Secondary data are statements and interpretations of previous events and are found for example by library searches. They are non-reactive, unobtrusive and economical in terms of time and money.

Data can be obtained in formal or informal settings, and involve verbal (oral and written) or non-verbal acts or processes (Open University, 1979). Each of these data collection methods has certain advantages and limitations which will be discussed. The chosen method will depend on the nature of the data for collection. Gill and Johnson (1997) identify four different methods of obtaining data: survey, ethnographic, experimental and action research,

Survey Research

Survey research is the method of gathering data from respondents thought to be representative of some population, using an instrument composed of closed structure or open-ended items (questions). This is perhaps the dominant form of data collection in the social sciences, providing for efficient collection of data over broad populations, amenable to administration in person, by telephone, and over the Internet. Some forms of survey research by telephone or the Internet may be completely automated. Critics of survey research methodology hold it to be a method which artificially forces respondents to formulate opinions, masking the complexity of conflicting views and unconscious biases within each respondent, and critics note that in many arenas (e.g., race relations) survey items poorly predict actual behavior. Surveys are concerned primarily with addressing particular characteristics of a specific population of subjects, either at a fixed point in time or at varying times for comparative purposes (Gill and Johnson, 1997). The main concern of surveys is to secure a representative sample of the relevant population which in turn dictates

whether any subsequent assessments of the attributes of that population are generalisable, i.e. the population validity.

The form a survey takes differs considerably depending on the intentions and dispositions of the researcher. "Surveys may take the form of an interview accompanied by a questionnaire, or just by self-administered questionnaires" (Gill and Johnson, 1997). Glastonbury and Mackean (1991) suggest that if the quality and depth of information is more important than its quantity, then interviews should be undertaken. Whereas if the questions are fairly easy to answer and a large number of responses is required to complete statistical analysis then questionnaires may be more suitable and sufficient.

Use of Interviews

Interviews, says Darlington (2002), are among the most challenging and rewarding forms of measurement. They require a personal sensitivity and adaptability as well as the ability to stay within the bounds of the design of the interview.

Face-to-face interviews are a direct communication, primary research collection technique. If relatively unstructured but in-depth, they tend to be considered as part of *qualitative research*. When administered as an intercept survey or door-to-door, they are usually part of *quantitative research* (Lincoln 1985).

The opportunity for feedback to the respondent is a distinct advantage in personal interviews. Not only is there the opportunity to reassure the respondent should s/he be reluctant to participate, but the interviewer can also clarify certain instructions or questions. The interviewer also has the opportunity to probe answers by asking the respondent to clarify or expand on a specific response. The interviewer can also supplement answers by recording his/her own observations, for instance there is no need to ask the respondent's gender or the time of day/place where the interview took place

Seidman (1991) posits that "we can have an 'observational understanding' of an individual's action, but to understand his/her behavior, we will have to gain access to

the individual's 'subjective understanding', i.e., to know what meaning he/she makes out of this action, to be able to put the behavior in context". He further asserts that a researcher could approach the experience of people through documentary analysis or observation, but if the primary goal of a study is to understand the meaning people involved in education make of their experience, then interviewing provides almost a sufficient method of investigation. It offers researchers an access to people's ideas, thoughts, and memories in their own words, rather than in the words of the researcher. Seale (1998) added that the advantages of interviewing lie chiefly in its flexibility. She observed that if carefully applied, interviews could be used "to gather information of greater depth and more sensitive to contextual variations in meaning".

Qualitative interviews may be used either as the primary strategy for data collection, or in conjunction with observation, document analysis, or other techniques (Bogdan 1982). Qualitative interviewing utilizes open-ended questions that allow for individual variations. (Patton 1990) writes about three types of qualitative interviewing: 1) informal, conversational interviews; 2) semi-structured interviews; and 3) standardized, open-ended interviews.

Addressing issues of 'Bias' in Interviews

Interviewing is a complex activity that is shaped, affected and influenced by a number of factors. These include the power relations between the interviewer and the interviewee, their gender, age, and class identities, etc. Thus, issues of researcher and respondents' biases are likely to occur and deliberate measures must be put in place to address them. As Greenbank (1999) states, "those who profess to carry out value-neutral research are deluding themselves... [and they] are also misleading others by presenting their research as depersonalized and value-free" He further state that however well designed a research is, it will never achieve neutrality, as even the researchers' sampling methods, "are likely to reflect their (often unconscious) values".

This researcher addressed issues of bias by triangulation of instruments of data collection (documents analysis, observation and interviews) and feed-back of results to research participants.

Focus Group Discussions

A focus group interview has been defined as “a research technique that collects data through group interaction on a topic determined by the researcher” (Morgan 1984) and a “way of listening to people and learning from them” Kitzenger (1999) posited that focus groups are especially useful “for allowing participants to generate their own questions, frames and concepts to pursue their own priorities on their own terms, in their own vocabulary”. They also assert that a focus group has the potential of enabling researchers to examine individuals’ different perspectives as they work within a social network. Particular advantage of focus group, observed Darlington and Scott (2002), “relates to the benefits of group interaction, such as the extent to which the cross-flow of communication sparks ideas that would not emerge easily in a one-to-one interview” Groups also take the pressure off participants to respond to every question. Hearing others talk about their experiences, in a supporting environment, may enable participants to feel comfortable about sharing their own experiences.

There is however some limitations of focus groups as discussed in the research literature. Hedges (1996) have for instance, observed issues such as peer group influence, which might compel some members to agree with dominant positions, and become ‘constrained in what they say in front of their peers’. He also warned that focus groups might be less suitable for handling sensitive or ‘private’ topics and stressed the possibility of organizational difficulty in getting voluntary participants at a given time and place.

Use of Questionnaire

In usability glossary, Brehob (2001) defines a questionnaire to be "a form that people fill out, used to obtain demographic information and views and interests of those questioned". Kirakowski (1998) defines a questionnaire in a more structural way as "a *method* for the *elicitation*, and *recording* and *collecting* information". Researchers use questionnaires as tools (methods) to capture what is in respondents’ mind(s) (elicitation). The data collected from a group of respondents is recorded onto a permanent medium to be analyzed and referenced later.

A vital skill in undertaking a survey is the ability to structure, focus, phrase and ask sets of questions in a manner that is intelligible to the respondents (Gill and Johnson, 1997). Such questions also need to minimize bias, and guide the respondents in order to optimize the information obtained. To achieve these objectives Gill and Johnson (1997) identify four interrelated issues that need to be considered in questionnaire design: questionnaire focus, question phraseology, the form of response which determines the use of open-ended or closed questions, and the sequencing of questions and overall presentation. It is believed that open-ended questions give respondents a greater freedom to answer the question, while closed questions limit the breadth of answer to be given (May 1997).

Questionnaires may be mailed for self-completion or used to accompany interviews. Mail or self-completion questionnaires enable a large number of respondents to be approached within a short period of time. It does however require considerable planning and pre-testing to ensure understanding of wording to minimize inconsistencies. In the case of questionnaires accompanying interviews, the questionnaire has several functions (McCracken 1988):

- To ensure that the investigator covers all the terrain in the same order for each respondent.
- To allow for prompts necessary to manufacture distance.
- To establish channels for the direction and scope of discourse.
- To allow the investigator to give all his/her attention to the informant's testimony.

Ethnography

Ethnography is a social science research method. It relies heavily on up-close, personal experience and possible participation, not just observation, by researchers trained in the art of ethnography. These ethnographers often work in multidisciplinary teams. The ethnographic focal point may include intensive language and culture learning, intensive study of a single field or domain, and a blend of historical, observational, and interview methods. Typical ethnographic research employs three kinds of data collection: interviews, observation, and documents. This in turn produces three kinds of data: quotations, descriptions, and excerpts of documents, resulting in one product: narrative description. This narrative often includes charts,

diagrams and additional artifacts that help to tell "the story" (Hammersley 1989). Ethnographic methods can give shape to new constructs or paradigms, and new variables, for further empirical testing in the field or through traditional, quantitative social science methods.

The key feature of the ethnographic approach is that it is based on what are termed naturalist modes of inquiry, such as participant observation, within a predominantly inductivist framework. It allows the researcher to use the socially acquired and shared knowledge available to the participants to account for the observed patterns of human activity (Gill and Johnson, 1997).

Ethnography focuses on the manner in which people interact and collaborate in observative and regular ways (Fetterman 1989). Ethnographers attempt to understand the culture of the situation and to interpret it in the way that its members do without conducting experiments or interviews in artificial environments. Smircich (1983) identifies three main approaches to ethnography:

- *Observation*: where the researcher takes the role as a spectator only, observing events and processes without being involved in interactions with the subjects.
- *Participation*: where the researcher is immersed completely into a social setting and adopting a role of full participation in everyday lives of subjects.
- *Gathering documents* from all available sources and wherever possible comparing information.

The ethnographic method of research has a number of weaknesses: it has low internal validity, low population validity, and low reliability (Gill and Johnson, 1997). It is also time consuming. It is generally suited to small scale exploratory work to discover areas worth further investigation; cross validating in a natural setting results achieved by other methods; investigating relatively unknown social in their natural setting to develop theories to be validated by other research methods (Bell 1994)

Triangulation

Triangulation is the application and combination of several research methodologies in the study of the same phenomenon.

- It can be employed in both quantitative (validation) and qualitative (inquiry) studies.
- It is a method-appropriate strategy of founding the credibility of qualitative analyses.
- It becomes an alternative to " traditional criteria like reliability and validity"
- It is the preferred line in the social sciences

By combining multiple observers, theories, methods, and empirical materials, sociologists can hope to overcome the weakness or intrinsic biases and the problems that come from single method, single-observer, and single-theory studies. There are five basic types of triangulation (Dane, 1990):

- data triangulation, involving time, space, and persons
- investigator triangulation, which consist of the use of multiple, rather than single observers;
- theory triangulation, which consists of using more than one theoretical scheme in the interpretation of the phenomenon;
- methodological triangulation, which involves using more than one method and may consist of within-method or between-method strategies.
- multiple triangulation, when the researcher combines in one investigation multiple instruments of data collection

Case Study Approach

Case study research is a time-honoured, traditional approach to the study of topics in social science and management. Because only a few instances are normally studied, the case researcher will typically uncover more variables than he or she has data points, making statistical control (e.g., through multiple regressions) an impossibility. This, however, may be considered a strength of case study research: it has the capability of uncovering causal paths and mechanisms, and through richness of detail, identifying causal influences and interaction effects which might not be treated as operationalized variables in a statistical study,

Hartley (1994) characterizes a case study as consisting of “a detailed investigation, often with data collected over a period of time, of one or more organizations, or groups within organization, with a view to providing an analysis of the context and processes involved in the phenomenon”. (Yin 1994) adds that case study approach can be theoretically exciting and data rich.

Robson (1993) defines a case study as: ‘a well established strategy where the focus is on a case (which is interpreted very widely to include the study of an individual person, a group, a setting, an organization, etc) in its own right and taking its context into account’. This strategy is based on the belief that understanding and explaining why a phenomenon happens the way it does, according to Sturman (1997), requires “an in-depth investigation of the interdependencies of parts and of the patterns that emerge”.

Critics of the case study method believe that the study of a small number of cases can offer no grounds for establishing reliability or generality of findings. Others feel that the intense exposure to study of the case biases the findings. Some dismiss case study research as useful only as an exploratory tool. Yet researchers continue to use the case study research method with success in carefully planned and crafted studies of real-life situations, issues, and problems. Reports on case studies from many disciplines are widely available in the literature.

Many well-known case study researchers such as Robert E. Stake, Helen Simons, and Robert K. Yin have written about case study research and suggested techniques for organizing and conducting the research successfully. This introduction to case study research draws upon their work and proposes six steps that should be used:

- Determine and define the research questions
- Select the cases and determine data gathering and analysis techniques
- Prepare to collect the data
- Collect data in the field
- Evaluate and analyze the data
- Prepare the report

Case studies, according to Feagin, et al (1991), are the preferred strategy when 'how' or 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context. The case study is especially appropriate when the boundaries between phenomenon and context are not clearly evident. The case study copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion.

In recent years there has been increased attention to implementation of case studies in a systematic, stand-alone manner which increases the validity of associated findings. However, although case study research may be used in its own right, it is more often recommended as part of a multi-method approach ("triangulation") in which the same dependent variable is investigated using multiple additional procedures (ex., also as survey research, network analysis, focus groups, content analysis, ethnography, narrative analysis, archival data, or others).

5.2.4 Data Analysis Techniques

Qualitative data usually consist of the words or actions of participants. These data can be difficult to condense and organise without losing their meaning. Analysis of qualitative data requires considerable creativity on the part of the researcher. It involves summarizing the mass of data collected and presenting the results in a way that communicates the most important features.

Bogdan and Biklen (1982) define qualitative data analysis as "working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others". Qualitative researchers tend to use inductive analysis of data, meaning that the critical themes emerge out of the data (Patton 1990). Qualitative analysis requires some creativity, for the challenge is to place the raw data into logical, meaningful categories; to examine them in a holistic fashion; and to find a way to communicate this interpretation to others.

Sitting down to organize a pile of raw data can be a daunting task. It can involve literally hundreds of pages of interview transcripts, field notes and documents. The mechanics of handling large quantities of qualitative data can range from physically sorting and storing slips of paper to using one of the several computer software programs that have been designed to aid in this task (Browne 1996).

Analysis begins with identification of the themes emerging from the raw data, a process sometimes referred to as "open coding" (Strauss 1994). During open coding, the researcher must identify and tentatively name the conceptual categories into which the phenomena observed will be grouped. The goal is to create descriptive, multi-dimensional categories which form a preliminary framework for analysis. Words, phrases or events that appear to be similar can be grouped into the same category. These categories may be gradually modified or replaced during the subsequent stages of analysis that follow.

As the raw data are broken down into manageable chunks, the researcher must also devise an "audit trail"—that is, a scheme for identifying these data chunks according to their speaker and the context. The particular identifiers developed may or may not be used in the research report, but speakers are typically referred to in a manner that provides a sense of context (Brown, 1996). Qualitative research reports are characterized by the use of "voice" in the text; that is, participant quotes that illustrate the themes being described.

The next stage of analysis involves re-examination of the categories identified to determine how they are linked, a complex process sometimes called "axial coding" (Strauss and Corbin, 1994). The discrete categories identified in open coding are compared and combined in new ways as the researcher begins to assemble the "big picture." The purpose of coding is to not only describe but, more importantly, to acquire new understanding of a phenomenon of interest. Therefore, causal events contributing to the phenomenon; descriptive details of the phenomenon itself; and the ramifications of the phenomenon under study must all be identified and explored. During axial coding the researcher is responsible for building a conceptual model and for determining whether sufficient data exists to support that interpretation.

Finally, the researcher must translate the conceptual model into the story line that will be read by others. Ideally, the research report will be a rich, tightly woven account that "closely approximates the reality it represents" (Strauss and Corbin, 1994).

Although the stages of analysis are described here in a linear fashion, in practice they may occur simultaneously and repeatedly. During axial coding the researcher may determine that the initial categories identified must be revised, leading to re-examination of the raw data. Additional data collection may occur at any point if the researcher uncovers gaps in the data. In fact, informal analysis begins with data collection, and can and should guide subsequent data collection.

A well known method of analysis that deals with large volumes of data is that of grounded theory (Glaser 1967). This method aims to generate rather than test theory. This is achieved by focusing on the development of substantive theory drawn from the organizational participants as it emerges and looks to integrate new insights as they are introduced throughout the investigation. The inquiry is therefore viewed as an interactive process between the researcher and the participant. Strauss and Corbin (1994) consider the definitive features of the grounded theory method to be: the grounding of theory upon data through the process of *data/theory interplay*; the making of constant comparisons; the asking of theoretically oriented questions; theoretical coding; and the development of theory. Bryman (1988) gives three reasons for the prevalence of this approach within qualitative research:

- It allows theory to emerge from data so that it does not lose touch with its empirical referent.
- It provides a framework for the qualitative researcher to cope with the unstructured complexity of social reality and render it manageable.
- It allows the development of theories and categories which are meaningful to the subject of the research, an important virtue if the investigation is meant to have a practical pay-off.

The procedures of the grounded theory approach are summarized in table 5.1.

Step	Activity	Comment
1	Collect data	Any source of textual data may be used, but semi-structured interviews or observations are the most common.
2	Transcribe data	It is necessary to produce full transcripts of the data in order to analyze it.
3	Develop categories	Categories are developed from data by open coding of transcripts.
4	Saturate categories	Further examples are gathered as one proceeds through transcripts until no new examples of a particular category emerge.
5	Abstract definitions	Once categories have been saturated, formal definitions in terms of properties and dimensions of each category may be generated.
6	Theoretical sampling	From the categories which have emerged from the first samples to help test and develop categories further.
7	Axial coding (the development and testing of relationships between categories)	Using the method of axial coding, possible relationships between categories are noted, hypothesized and tested against data which is being obtained in ongoing theoretical sampling.
8	Theoretical integration	A core category is identified and related to all the other subsidiary categories by means of the coding paradigm, and links with existing theory are established and developed.
9	Grounding the theory	The emergent theory is grounded by returning to the data and validating it against actual segments of text.
10	Filling in gaps	Finally, any missing detail is filled in by the further collection of relevant data.

Table 5.1 The Processes of a Grounded Theory Study. *Source: Payne, S. and Bartlett, D. (1997)*

Section 5.1 has reviewed the theoretical basis of the variety of research methods available. Based on this assessment the remainder of the chapter will discuss the adopted methodology and the specific techniques and instruments utilized to collect and analyze data for this particular research study, and present how the research strategy was implemented during the research period.

5.3 Adopted Research Methodology

In this study, it is believed that aspects of qualitative and quantitative approaches are complementary and the design of the methodology draws on both. However, the study is driven primarily on qualitative approach. Schumacher (2001) suggest that qualitative research “describes and analyses people’s individual and collective social actions, beliefs, thoughts and perceptions. The researcher interprets phenomena in terms of the meanings people bring to them”. Thus, qualitative method of enquiry is being considered because of the subjective nature of the study. Nevertheless, the application of quantitative approach was used to address measurable phenomena.

Since the study sought to explore peoples’ beliefs and actions in a given social world, it is important to adopt a methodology that includes the direct experience of those actors for an interpretation and understanding of their social world, which is a strong feature of much qualitative research.

The view that objectivity is superficial is very much accepted. Rather, subjectivity is a permanent feature of human life. Everyone has a way in which he/she perceives an object or a phenomenon, and it is within this perception that an individual develops an attitude and exhibits some behaviour towards it. Thus, how and why persons or groups of persons act the way they do can only be fully understood within the individuals’ perspectives, i.e., their subjective interpretations of their social world. Accordingly, this researcher favour those proponents of the qualitative paradigm who claim that knowledge is socially constructed, historically developed and is value-laden.

A positivist approach on the other hand is deemed inappropriate as a principal methodology for this particular study because as Bassegy (1999) argues, “it predominantly regards the ‘truth’ as universal and somewhere ‘out there’, beyond us”. Vulliamy (1990) also opined that “it adopts an objective view where the truth is dehumanized, tests hypotheses where the subjects of the research become the objects and believes that scientific knowledge is free from social construction”. Positivism, according to Cohen et al, strives “for objectivity, measurability, predictability, controllability, patterning, the construction of rules of behavior and the ascription of causality” These standpoints do not meet with the realities of this research, or with

the researcher's beliefs about social reality, as earlier advanced in the preceding paragraphs.

There are several considerations when deciding to adopt a qualitative research methodology. Strauss and Corbin (1994) claim that qualitative methods can be used to better understand any phenomenon about which little is yet known. They can also be used to gain new perspectives on things about which much is already known, or to gain more in-depth information that may be difficult to convey quantitatively. Thus, qualitative methods are appropriate in situations where one believes that quantitative measures cannot adequately describe or interpret the situation under study.

The ability of qualitative data to more fully describe a phenomenon is an important consideration not only from the researcher's perspective, but from the reader's perspective as well. "If you want people to understand better than they otherwise might, provide them information in the form in which they usually experience it" (Lincoln 1985). Qualitative research reports, typically rich with detail and insights into participants' experiences of the world, may be epistemologically in harmony with the reader's experience and thus more meaningful.

Features of Qualitative Research

Several writers have identified what they consider to be the prominent characteristics of qualitative, or naturalistic, research (see, for example: Bogdan and Biklen, 1982; Lincoln and Guba, 1985; Patton, 1990; Eisner 1991). The list that follows represents a synthesis of these authors' descriptions of qualitative research:

1. Qualitative research uses the natural setting as the source of data. The researcher attempts to observe, describe and interpret settings as they are, maintaining what Patton (1990) calls an "empathic neutrality"
2. The researcher acts as the "human instrument" of data collection.
3. Qualitative researchers predominantly use inductive data analysis.
4. Qualitative research reports are descriptive, incorporating expressive language and the "presence of voice in the text" (Eisner 1991)
5. Qualitative research has an interpretive character, aimed at discovering the meaning events have for the individuals who experience them and the interpretations of those meanings by the researcher.

6. Qualitative researchers pay attention to the idiosyncratic as well as the pervasive, seeking the uniqueness of each case.
7. Qualitative research has an emergent (as opposed to predetermine) design, and researchers focus on this emerging process as well as the outcomes or product of the research.

Patton (1990) points out that these are not "absolute characteristics of qualitative inquiry, but rather strategic ideals that provide a direction and a framework for developing specific designs and concrete data collection tactics". These characteristics are considered to be "interconnected" (Patton 1990) and "mutually reinforcing" (Lincoln and Guba, 1985).

It is important to emphasize the emergent nature of qualitative research design. Because the researcher seeks to observe and interpret meanings in context, it is neither possible nor appropriate to finalize research strategies before data collection has begun (Patton, 1990). Qualitative research proposals should, however, specify primary questions to be explored and plans for data collection strategies.

The particular design of a qualitative study depends on the purpose of the inquiry, what information will be most useful, and what information will have the most credibility. There are no strict criteria for sample size (Patton, 1990). "Qualitative studies typically employ multiple forms of evidence...[and] there is no statistical test of significance to determine if results 'count'" (Eisner, 1991). Judgments about usefulness and credibility are left to the researcher and the reader.

The critical area of importance in this case is the need to gain a full and true understanding of the reality in question, in terms of the way assets and facilities are managed in the colleges, and how these can be improved. This requires a research approach that offers the ability to achieve depth, as:

- The study is attempting to propose a framework for the implementation of a new concept, which necessitates an open and active exchange between the researcher and participants.

- The nature of the area of investigation, improving management of assets in the Nigerian Federal Colleges of Education, is such that it relies on communication, human interaction and relationships.
- The sample of stakeholders interviewed within each college is small, thus leading to the need for depth versus breadth from the information collected.
- Assessment of condition of existing facilities and prevailing management practices in each college will rely to a certain extent on perception.

Further, as organizational issues may be seen as a "softer" more intangible aspect of science, this reinforces the need for an inductive perspective so that it would facilitate the most appropriate collection and interpretation of information. It is argued, therefore, that investigation of the research problem should incorporate an inductive approach in order to understand the different aspects and influences on processes within an organization.

Based upon these requirements and the assessment of the methods outlined in section 5.1, it is argued that due to the exploratory nature of this research study qualitative methods of research present the most appropriate basis from which to develop a specific method of inquiry. A grounded theory based approach has been utilized as the basis for methodology and data triangulation by applying an interactive holistic process mirroring that of Cunningham (1988). This holistic view of the research methodology was considered necessary to link the large volumes of data and use the outcome to spark further inquiry in order to arrive at the emergent theory. It is also believed that the use of a number of research methods leads to more valid results (Rose and Sullivan, 1996).

5.3.1 Data Collection Procedure

The method chosen to collect data was determined from an extensive literature search as earlier discussed in this chapter. Data was collected via case studies, interviews, participant observation, data analysis and by review of the appropriate literature within a multiple case study design. Sample was selected by the judgment and

convenience methods. This section therefore highlights these methods as well as gives a brief overview of how the research process was administered.

5.3.2 Case Study Approach

Case study research approach has been discussed in *section 5.1.3.6* above. The method excels at bringing researchers to an understanding of a complex issue or object and can extend experience or add strength to what is already known through previous research. Case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. Researchers have used the case study research method for many years across a variety of disciplines. Social scientists, in particular, have made wide use of this qualitative research method to examine contemporary real-life situations and provide the basis for the application of ideas and extension of methods. Yin (1984) defines the case study research method as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.

Yin (1994) also sees case study as a preferred strategy when ‘how’ or ‘why’ questions are raised and when the researcher has little control over events, noting that the distinct call for case studies emerges out of the desire to understand a complex social phenomenon. In other words, a case study provides insights into how and why a phenomenon works in real life situation. On this basis, Yin (1994) argues that case studies contribute uniquely to our knowledge of individual, organizational, social and political phenomena.

Case studies tend to be selective, focusing on one or two issues that are fundamental to understanding the system being examined. In this study, a case study research strategy was used to explore how assets in the Nigerian Federal Colleges of Education are managed and how best to bring about desired improvements. The study addressed some of the challenges that revolve around the validity of case studies mainly through testing the developed model and strategy guide against the case study collages and other colleges not involved in the study, and the triangulation of methods and data.

A pilot study was carried out where research instruments were developed and tested, before the conduct of the main study, which involved three colleges. Case study research is not sampling research; that is a fact asserted by all the major researchers in the field, including Yin, Stake, Feagin and others. However, selecting cases must be done so as to maximize what can be learned in the period of time available for the study. The researcher therefore employed purposive and convenient sampling to select case study colleges. Details of the sampling processes have been discussed in the next section.

5.3.3 Sampling

Sampling techniques in qualitative research has been discussed in *section 5.1.2* above. It is the act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population. The purpose of sampling is to draw conclusions about populations from samples. Inferential statistics are used to determine a population's characteristics by directly observing only a portion (or sample) of the population. A sample is obtained rather than a complete enumeration (a census) of the population for many reasons. Obviously, it is cheaper to observe a part rather than the whole. It is not good enough, though, to assume that findings for the sample will be replicated in the rest of the population, so therefore the sample in the first place needs to be carefully selected if there is to be any confidence that the findings from the sample are similar to those found among the rest of the category under investigation.

Social researchers have been using two types of sampling techniques as discussed in the said *section 5.1.2*. The first is known as probability sampling, the second as non-probability. Probability sampling, as the name suggests, is based on the idea that the people or events that are chosen as the sample because the researcher has some notion of the probability that these will be representative cross-section of the people or events in the whole population being studied. On the other hand non-probability sampling is conducted without such knowledge about whether those included in the sample are representative of the overall population. Members are selected from the population in some nonrandom manner. These include convenience sampling, purposive sampling, quota sampling, and snowball sampling.

This researcher had employed forms of non-probability sampling as the basis for selecting the sample. The crucial and defining characteristics of non-probability sampling whatever from it takes, is that the choice of colleges or people to be included in the sample is definitely not a random selection. Streubert & Carpenter (1995) point out that there is no need to randomly select individuals because manipulation and control are not the purpose of the exercise.

In selecting case study Colleges and those who participated in interviews, workshops and conferences therefore, the researcher used purposive sampling, a method that selects information rich cases for in-depth study. A purposive sample is one which is selected by the researcher subjectively. The researcher attempts to obtain sample that appears to him to be representative of the population and will usually try to ensure that a range from one extreme to the other is included.

Dane (1990) points out the advantage of purposive sampling is that it allows the researcher to identify people or events, which have good grounds in what they believe, will be critical for the research. Instead of going for the typical instances, a cross-section or a balanced choice, the researcher will be able to concentrate on instances which display wide variety – possible even focus on extreme cases to illuminate the research question at hand. In this sense it might not only be economical but might also be informative in a way that conventional probability sampling can not be (Descombe, 1998). With a non-probability sampling methods the researcher feels that it is not feasible to include a sufficiently large number of examples in the study, this very much goes hand in hand with qualitative research.

There are some sound theoretical reasons why most qualitative research uses non-probability-sampling techniques and good practical reasons why qualitative researcher deals with small numbers of instances to be researched. Phenomenology is well suited to purposeful sampling. This type of sampling permits the selection of interviewees whose qualities or experiences permit an understanding of the phenomena in question, and are therefore valuable. This is one of the strengths of purposive sampling.

Conducting studies in three selected colleges, in addition to the pilot college is considered as adequate representation of the twenty one Federal Colleges of Education in the country, and conclusions drawn from the case studies can be

applicable to all colleges, because they all share some high level of commonality. In the first place, the colleges are all established and funded by the Federal Government, with the mandate of producing primary and junior secondary school teachers. Therefore, they have common corporate objectives (*see chapter 6*) and are bound by the same policy guidelines. A central body, the National Commission for Colleges of Education (NCCE), established by same Federal Government, coordinates their activities, including curriculum and physical facilities development.

In this research therefore, the sampling technique used in drawing the case study colleges and interviews/workshop participants is purposive. The fieldwork, which was conducted over a period of six months, involved a pilot study in one of the medium size colleges. The main study involved three Federal Colleges of Education; one each from the former three geopolitical regions of Nigeria – Northern, Southwestern and Southeastern region, respectively. This is aimed at reflecting the cultural diversity of the country. The selection of the case study colleges also reflects the three categories of the Federal Colleges in terms of size (population). Each case study College therefore belongs to a particular region and a particular size category of the colleges. Appendix A shows the categorization of the colleges according size (population) and geopolitical zones.

In the same vein, sampling of interviewees and workshop participants was done in manner that involved those whose qualities or experiences permit an understanding of the aims and objectives of the study, and are therefore valuable. The sampling also reflects the broad spectrum of stakeholders in manner that provides adequate representation. This sample is given in appendix E.

5.3.4 Instruments and Procedures for Data Collection

The study used a triangulation of instruments, involving examination of documents, observation of physical facilities and interviews. This is a common practice with case study research, in order to strengthen the data. It is aimed at achieving credibility for the research findings. Since the meanings of the social world are dynamic, the use of different methods was aimed at overcoming the intrinsic bias that is bound to come in case studies. Accordingly, this study used interviews, observations and document

analysis. Interviews and observations were the principal tools, while documents were used as a springboard to interviews and observations. Below is the detail of how these instruments were used in the research.

Documents Analysis

Yin (1994) argues that documentary data are likely “to be relevant to every case study topic”. This researcher used it in conjunction with other methods as outlined in the preceding sections. Overall, the central point for incorporating this source of data is to help in providing a rich vein for analysis.

It is important to note that documentary records are themselves not value-free. Punch (2000) suggests four ways of evaluating documentary data. These are: its authenticity (its originality and genuineness), its credibility (which relates to its accuracy), its representativeness (whether it represents the totality of documents of its class) and its meaning (what it is intended to say). The researcher therefore examined relevant documents that could provide insights into college goals and objectives; service delivery requirements; what assets and facilities are available; how and why they were procured; what are the projected assets and facilities requirements; what are the gaps between the required and existing facilities; what factors are responsible for the gaps; what asset management practices employed; etc. Documents examined among others, include the following:

- College corporate goals, mission statement and academic plan
- Current and projected student and staff population
- Government policy on asset procurement, maintenance and disposal
- Maps, building plans and photographs
- Budget plans
- Estate terrier (schedule of all properties)
- Information on tenure of buildings
- Maintenance plan
- Building use and floor space schedules
- Valuation, leases and insurance information
- Major works programmes
- Environmental policies, transport and parking policies
- Running cost
- Development plan
- Management structure of estate department and staff development plan

It may be noted that while the researcher found most of the above documents and many more, some documents however, were not available in some colleges. In such situations, the researcher only relied on information gathered from physical observation of facilities/events, and interviews/group discussions, along with the available documents, and the researcher's personal experiences, to arrive at conclusions.

Observation

Punch (2000) posits that a researcher should decide 'what will be observed and why'. The main objective of the observation is to ascertain the extent to which assets meet service delivery requirements of the colleges. This is very essential, especially that the adequacy/functionality or otherwise of assets can affect the realization of goals of the colleges as a whole. Observation had helped this researcher in gaining insights into what is on the ground. Such insights were useful in the content of interview questions as well as in understanding the context within which interviewees responded to the researcher's questions. Darlington and Scott (2002) noted that "observation is a very effective way of finding out what people do in particular contexts, the routines and interaction patterns of their everyday lives". They argue that observational research methods can provide an understanding of what is happening within and between an organization and the community, in this case within the colleges.

Observation was used for two main purposes: to have a first hand experience of what goes on. Here, it was used as a way of understanding the context of the phenomenon. This aided the researcher in getting to know the research context and begin to raise some pertinent questions for the research. Observation data were then used to hold in-depth interviews and group discussions with stakeholders, notably college administrators, lecturers and students. Then at the interview level, this researcher raised observations to respondents to comment on, so that he will have their subjective interpretation of what goes on regarding assets and their management.

Each asset was looked at in terms of its existing use and its future potentials. Cameras were used where necessary to record situations. The researcher particularly noted the following:

- Number and age of assets

- Physical condition of assets – new or as new; sound operationally safe, exhibiting only minor deterioration; operational, but minor replacement needed soon; inoperable or serious risk of failure or breakdown
- Capacity of assets
- Functionality of assets – fitness for purpose
- Space utilization
- Availability and functionality of Telecommunication and IT facilities
- Functionality of infrastructural facilities

In-Depth Interviewing

Seidman (1991) posits that “we can have an ‘observational understanding’ of an individual’s action, but to understand his/her behavior, we will have to gain access to the individual’s ‘subjective understanding’, i.e., to know what meaning he/she makes out of this action, to be able to put the behavior in context”. He further asserts that a researcher could approach the experience of people through documentary analysis or observation, but if the primary goal of a study is to understand the meaning people involved in education make of their experience, then interviewing provides almost a sufficient method of investigation. It offers researchers an access to people’s ideas, thoughts, and memories in their own words, rather than in the words of the researcher. Seale (1998) added that the advantages of interviewing lie chiefly in its flexibility. She observed that if carefully applied, interviews could be used “to gather information of greater depth and more sensitive to contextual variations in meaning”.

Interviews were held with students, lecturers, the college authority and the funding organizations, both at a start and at the end of the fieldwork. In conducting the interviews, the researcher was be conscious of the need for inclusion of different categories of respondents, in terms of gender, age, ethnicity, experience and socio-economic status.

The first phase of the interview was to understand respondents’ views on the asset and facilities needed to support the college corporate goals. It was to also seek respondents’ views on how adequate, effective and efficient existing assets and facilities are, in meeting service delivery requirements of the institutions and how procurement, maintenance, renewal and disposal of assets were planned and implemented. The second phase of the interview was focused more on the

researcher's observations, areas of ambiguity and sharp disagreements between respondents. It was meant to help clarify and even reshape earlier information as well as provide new insights that might not have been captured in the earlier interviews.

The use of interviews in research has a long tradition. Interviewing is largely favoured in qualitative research. Darlington and Scott (2002) argue in favour of interviewing thus: "Probably the central value of interview as a research procedure is that it allows both parties to explore the meaning of the questions and answers involved. There is an implicit or explicit sharing and/or negotiation of understanding in the interview situation, which is not so central and often not present, in other research procedures."

Interviewing is thus an active interaction, making-meaning process. Meaning is not merely elicited by apt questioning; it is actively and communicatively assembled in the interview encounter. Hence interviewing is chosen as a principal research tool for this proposed study mainly because getting access to individual actors will help explain and put into contexts, their assumptions, beliefs and actions.

As earlier indicated, the principal question that this study hopes to address is: To what extent are assets in Federal Colleges of Education adequate in meeting service delivery requirements and what are the implications for achieving institutional goals? To help answer this broad question, the semi-structured interview had a number of questions that are largely based on researcher's observation of physical facilities and examination of documents. Example of the questions that featured during the interviews is given the attached appendix E.

For the semi-structured interviews and focus group discussions, a range of 45 – 55 respondents were targeted for each case study college, depending on the size the college under study. This number was made up of:

- 5 principal officers – the Provost, Director of Estate, Bursar, Registrar and the Librarian
- five officials of the estate department
- Ten officials of staff associations, for group discussions
- Five individual academic staff
- Five non academic staff
- Ten officials of student union for group discussions

- Ten respondents for the second phase of the interview, who helped to clarify and even reshape earlier information as well as provide new insights that might not have been captured in the earlier interview. The respondents were drawn from across all stakeholders, including officials of supervisory agency.

5.3.5 Methods of Data Analysis

Analysis of data in this research involves summarizing the mass of data collected and presenting the results in a way that communicates the most important features. Analysis was concurrent with data collection. It was systematic, comprehensive and ends only after the new data no longer generate new insights. Data analysis was an ongoing exercise throughout the fieldwork. After the completion of data gathering, the researcher further analyzed all data segments to achieve a sense of whole.

Data for analysis came from many sources and were in many forms. They were obtained through interviews, group discussions, observation and content analysis of existing data and materials, and they include interview tapes or transcripts, observation field notes, photographs, notes on interview context and process, analytical notes and memos, etc.

During the various stages of the study interview transcripts, findings from questionnaires and document analysis produced rich and voluminous amounts of data. Due to the qualitative nature of this data the grounded theory approach was seen to be appropriate due to the reasons previously discussed in section 5.1.

The data analysis process involved studying the raw data obtained from interviews, questionnaires, observation notes, documentation and the interaction workshop at each case study college to arrive at emergent categories. From the emergent categories, a cross-case analysis was undertaken and the more general problem areas that impede the efficient and effective management of assets in the colleges studied were identified. These categories were presented at the verification conference as the basis for the discussion to arrive at a consensus regarding what needed to be done to bring about improvement in the system. Details of these analyses are given in *chapter six* (The Field Studies).

5.3.6 Reliability and Validity

Reliability is of central concern to social scientists because the measuring instruments they employ are rarely completely valid. It relates to whether different researchers using the same measuring device would get the same results when measuring the same event. A method frequently used by social scientists for evaluating an instrument is its degree of reliability.

Validity is concerned with how accurately a variable fits a concept and the confidence, which others may have in the findings. It is also concerned with the relationship between a measuring instrument and the measurement outcomes. Validity is the assessment of whether ones findings or conclusions are faithful or true to what one is studying.

In respect of this research, the design for data gathering and data analysis was set out to be transparent and to ensure as far as possible that the data gathered reflects the contexts studied. The approach to data gathering and analysis thus incorporates rigorous cross checking and methodological triangulation to eliminate bias and establish reliability and validity. There was feedback system as well.

The triangulation strategy of verification is a method in which the researcher collects data through a combination of interviews, observation and document analysis. For example, what someone says in an interview can be checked against what the researcher observe in a field visit and what he see or read in documents relevant to the study. This facilitates some kind of pooled judgment which strengthens reliability and validity.

Feed back method involved asking the participants to comment on the researcher's interpretation of the data. That is, the tentative findings were taken back to some of the participants in an interactive workshop, to confirm if researcher's interpretation of data were correct.

The developed asset strategy model and the asset strategy development guide (process) were then tested against the case study colleges and other colleges not involved in the study, to enhance validity and reliability. An interactive workshop involving research

participants and other stakeholders were conducted for each college studied to verify and validate results.

5.3.7 Ethical Issues

Ethics generally refers to rules of conduct, typically, conforming to a code of set of principles. It is also understood that ethical issues permeate the research process, which arise at different stages of the research process. Ely, et al, (1991) posits that “Striving to be faithful to another’s viewpoint is striving to be ethical. Striving to maintain confidentiality is striving to be ethical. Striving to be trustworthy is striving to be ethical. Actually, ethical issues are present from the beginning and are woven throughout every step of the methodology”. The concerns for reliability and honesty are considered critical and very important and should be part of every research.

Given that interviewing is one of the research tools employed in this study, and because the objects of inquiry in interviewing are human beings, extreme care was taken to avoid any harm to them. Traditional ethical concerns, according to Denzin and Lincoln (1998), have revolved around the topics of *informed consent* (consent received from the subject after he or she has been carefully and truthfully informed about the research), *right to privacy* (protecting the identity of the subject) and *protection from harm* (physical, emotional or any other kind).

In carrying out the study therefore, the following ethical issues were taken into consideration: this researcher:

- Wrote official letters to the colleges, citing approval to conduct research, therefore solicited for cooperation and easy access to the research fields.
- Explained to the respondents and the gatekeepers the actual purpose of the research and abided by this in the process of the research.
- Gave assurances of confidentiality and anonymity to the respondents and the research fields.
- Gave assurance that the data to be collected would solely be used for the purpose of research and sharing any information except for research purposes will only be attended to with due permission from the concerned colleges.
- Was committed to non-exploitation of respondents. They determine when to be interviewed, what to say, and had the right to withdraw part or all of their opinion.
- Would not take as part of the data, any information from any individual without their knowledge or approval before such information is used as data

5.4 Conclusions

In this chapter, research methods had been discussed and research orientation and instruments of data collection that is most appropriate for addressing the research objectives has been identified and justified. Since the study seeks to explore peoples' beliefs, attitudes, expectations and actions in a given social environment, it is important to adopt a methodology that includes the direct experience of those actors for an interpretation and understanding of their social environment, and these are strong features of much qualitative research, the methods adopted by this researcher.

The research objectives set out in the introduction are best answered through case study approach, while triangulation data collection methods will be applied to address issues of reliability. Validity of the research findings will be achieved through testing back study results in case study colleges and other colleges not involved in the study.

In the next chapter details of field studies, involving the pilot and three main case study colleges are discussed.

CHAPTER SIX

The Field Studies

6.1 Introduction

Literature reviews in *Chapters two and three* had established the need for organizations to have in place an asset strategy which will align its asset planning and management with service delivery priorities and strategies, so that all assets support services in the most appropriate, effective and efficient way. Accordingly, an interim asset strategy model was developed as shown in Figure 4.4, with a view to aiding the Nigerian Federal Colleges of Education in developing their own strategies.

For the model to properly address the aspirations of the colleges however, it requires informed inputs of the college stakeholders, after making thorough examination of its contents and goals. A case study approach (discussed in *Chapter 5*) was therefore employed to achieve these objectives. This involves field studies by the researcher in some selected colleges, with interactive workshops organized at the end of study in each college, as discussed in this chapter. The workshops provided the opportunity to sensitize stakeholders on the needs, advantages and the processes of developing asset strategies, in addition to getting them to actively participate in developing the asset strategy model. A pilot study was conducted first, where the interim asset strategy and research instruments were tested, before the conduct of the main study in three other Colleges.

This chapter therefore is basically a continuation of the previous on Research Methodology. It summarizes the field study exercises which began with a Pilot study, conducted from 7th August – 15th September 2005, then the main field studies in three colleges, which took place between 7th Nov 2005 and 16th June 2006. The analysis of data obtained in the course of the field studies has also been discussed.

6.2 The Field Studies Process

In this study, the research focuses on exploration and gaining insight into the activities of the Federal Colleges of Education, in respect of the way they manage their physical assets and facilities; it also focuses on doing so through interpreting and understanding the perspectives of those being explored. As such the research is inductive and focuses on discovering meaning in context. The choice of case study was therefore based on applicability and utility in developing understanding, while choice of case study Colleges and those who participated in interviews/workshops were based on purposive sampling as earlier discussed in *Chapter five*. The principal method chosen to gather data was interview. This was complemented by analysis of documents, physical inspection of assets and facilities in the case study colleges and through interactive feedback workshops conducted in each college studied.

The field studies were conducted in three field visits (phases) which extended over a period of ten months. A fourth visit was undertaken a year after, for the purpose of validation of the asset strategy model. The first was the pilot study in one of the colleges that the researcher is very much familiar with, and where the earlier developed instruments of data collection were tested. At the end of the pilot study, an interactive workshop was conducted where the data obtained were verified. The interim asset strategy and study instruments were also further strengthened and stakeholders sensitized on the need for the colleges to develop strategic policies for managing their assets and facilities effectively and efficiently.

The second leg of the field work involved research studies in one of the three selected main case study Colleges, between 7th November 2005 and 20th January 2006, using the instruments reviewed during the pilot studies. An interactive verification workshop, similar to the one done during the pilot study was conducted, involving the major stakeholders.

The third field visit took place from 27th March to 16th June 2006 and it involved studies of two main case study Colleges. The exercises were conducted in same manner as the previous studies. Finally, a validation workshop was conducted, with participants drawn from case study colleges and other colleges not involved in the study.

Interim periods were spent back at Leeds. This moving in and out of the field offered the opportunity to stand back and reassess the process, consult with supervisors and make necessary adjustments in order to get the best out of the whole exercise. Figure 6.1 illustrates the process of the field work.

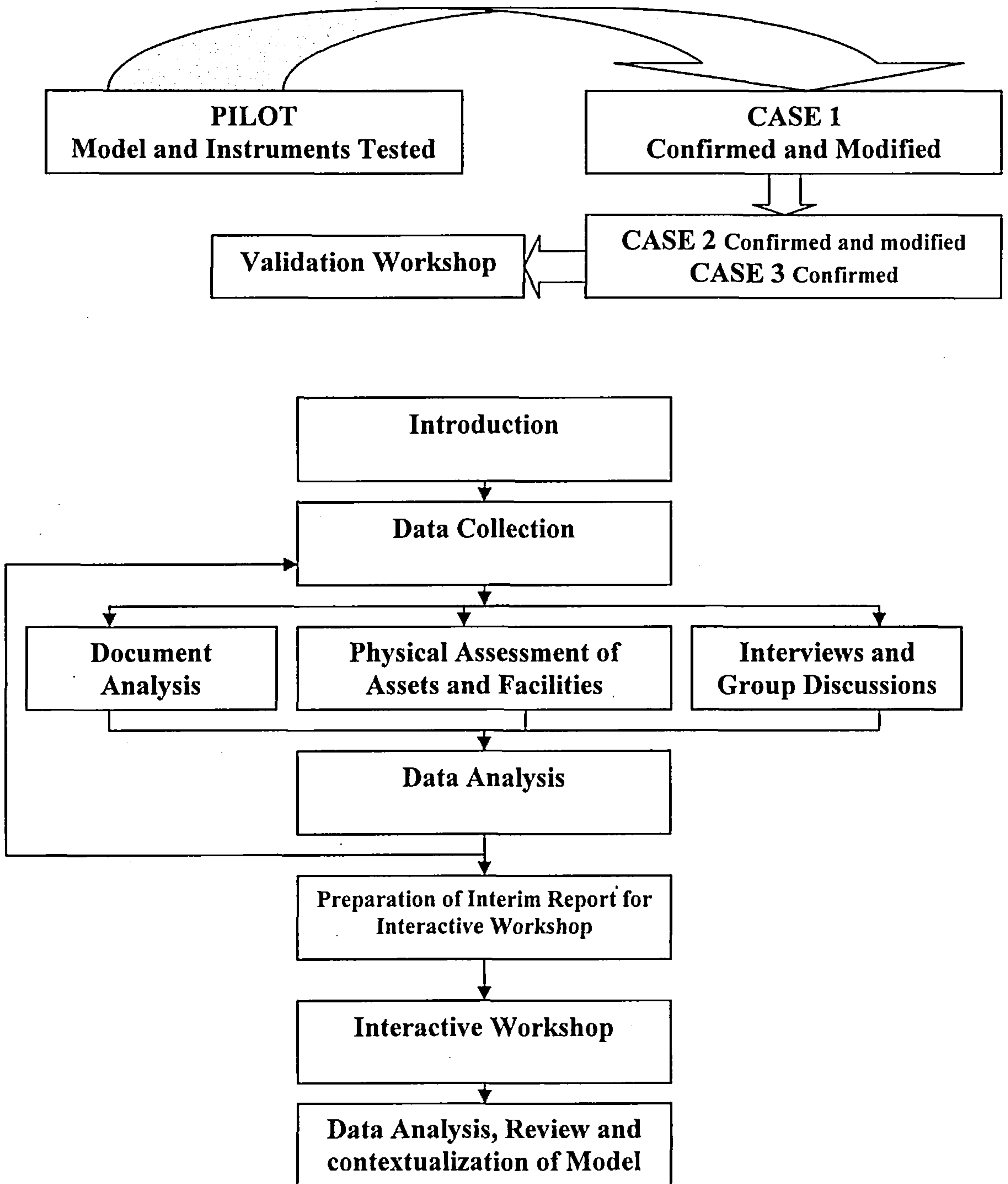


Figure 6.1 Field Study Process Diagram – Author 2007

Verification workshops

Interactive workshops were conducted at the end of the pilot study and also at the end of study in each of the main study Colleges. It was based on the concept of Eden (1990) that the desired model should be continuously constructed and modified in front of the participants by utilizing a "brainstorming" approach. This process is similar to focus groups which are widely used in qualitative grounded theory research (Stewart and Shamdasani, 1990; Morgan and Spanish, 1984). It is, however, dependent on the ability of the researcher to record, in real time, the views expressed by participants, and on the awareness of participants of the record being made so that they are able to verify the framework as it changes following the discussion. This allows for data to be fitted into the framework immediately through a process of gradual refinement, and seen in the full context of an agreed version of the framework.

This approach has been utilized during the field studies by conducting an interactive workshop at each of the case study colleges, following the interview sessions. During the workshops the interim asset strategy model was presented along with the general findings from the document analysis, observations and interviews. Discussion then took place regarding the field findings; the model and its applicability; gaps that needed to be filled and comparing the model with the current practice in each college. Flip charts were utilized to provide a way of attaining a sense of ownership that is built into the process which comes from giving a group a sense of history during a workshop. This has been achieved by building an array of flip charts which provided the opportunity to reorganize previous material to reflect the addition of new material into the model.

The information compiled during those workshops, in addition to the results from the physical inspection of assets and facilities, interviews and document analysis were then processed to introduce a modified and contextualized asset strategy model as discussed in *Chapter 7*.

6.2.1 Field Work Phase 1 – The Pilot Study

The term pilot study, according Bogdan (1982) is used in two different ways in social science research. It can refer to so-called ‘feasibility study’ which are small scale versions or trial runs, done in preparation for major study. It can also be the pre-testing or ‘trying out’ of a particular research instrument, and this is basically the case in respect of this study.

One of the advantages of conducting a pilot study is that it might give an advance warning about where the main research could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated.

The field study therefore commenced with the conduct of a pilot study in one of the colleges where this researcher is very much familiar with. The pilot College is of average size, in relation to other Colleges, in terms of student population and number of academic programmes. The College is located in the northern region of the country. The exercise commenced on the 7th August 2005 and lasted for five weeks

6.2.1.1 The Pilot Study Process

After observing necessary protocol and gaining access into the College, the procedure adopted by the researcher in the pilot study can be summarized as follows:

- Examination of existing documents, carrying out physical inspection of facilities and then conducting semi-structured interviews and group discussions with pilot respondents, in exactly the same way as it would be done in the main study
- Asking respondents for feedback to identify ambiguities and difficult questions
- Recording the time taken to complete the interview, observations and document examination, to decide whether it is reasonable
- Assessing whether each question got an adequate range of response
- Establishing that replies could be interpreted in terms of the information that was required

- Checking that all questions are answered, physical facilities observed and documents examined
- Revising the earlier developed asset strategy model and the study instruments
- Conducting workshop with all stakeholders to verify research instruments and the asset strategy model

Documents Analysis.

Most available documents (as in appendix D), were obtained and examined. The exercise was smooth and completed in good time, as most of the documents were assembled before commencement of the exercise. This was made possible by the notice given vide the introduction letter earlier sent to the college. Some of the documents however contained very little information because of poor documentation and record keeping. In such circumstances, the researcher had to lay much emphasis on physical observations, interviews and the interactive workshop, in order to obtain needed information. Those that could not be obtained include the following:

1. Maintenance plan – formal maintenance plan has not been developed. Maintenance is generally carried out on reactive and ad-hoc basis
2. Valuation report – experts had just been commissioned to undertake asset valuation of some selected assets for the purpose of insurance only. The last time such exercise was conducted was in early 2000.
3. FM contracts – no such documents available as all FM services are done in-house
4. Environmental, transport and parking policies – no formal documents on these exist
5. Estate department staff development plan – no formal staff development plans exist for the estate department. Members of staff are however encouraged to improve their skills by attending courses organized by professional bodies, universities and polytechnics. The college normally pays for such courses.

Observation

Physical assessment survey on all College assets and facilities were successfully conducted with the aid of an assistant and the college map. Each building/physical facility was inspected and broadly appraised to ascertain the extent to which it meets its service delivery requirements. Field notes were taken to record the physical condition as well as fitness for purpose for each building/facility. Some photographs were also taken. The observation had helped the researcher in gaining insights into what was on ground and that became very useful in content of questions during

interviews that were conducted thereafter, and also in understanding the context within which interviewees respond to researcher's questions.

The exercise afforded the researcher opportunity to gain insight into the real condition and functionality of all physical facilities and the utilization of same. Each asset/facility was looked at in terms of their existing use and future potentials. This was later to help the researcher in content of interview questions and in properly understanding the context within which interviewees respond to questions. The exercise was completed within the one week time frame.

The observation report was further analyzed along with that of the document analysis as well as the interview report to grade the facilities. Condition of buildings were accordingly graded A, B, C, & D according to RICS (2007) maintenance definitions, while fitness for purpose for each building was accordingly graded as good fit; above average; below average; and poor (see appendix B). Factors considered in grading fitness for purpose include: room sizes, location, furniture, environment, fittings and equipment.

Interviews and group discussions

Semi structured interviews and group discussions were held with the earlier proposed stakeholders. Some questionnaires were sent out to participants before the commencement of the exercise to enable them prepare adequately for the interview and also to afford those that might not be available for the interview, the opportunity to respond in writing.

The interviews were conducted in two phases; the first phase was to mainly understand respondents' views on the level of knowledge of college assets and asset management practice; how adequate, effective and efficient the existing assets and facilities are, in meeting service delivery requirements of the College; how procurement, maintenance and disposal of assets are planned and implemented, etc. The second phase of the interview focused more on the researcher's observations, areas of ambiguity and sharp disagreements between respondents. That had helped to clarify and even reshape some earlier information as well as provide new insights that

were not captured in the earlier interviews. Interviews were tape recorded and later transcribed and analyzed. Results were further analyzed along with the document analysis and the physical observation results. All these were to later constitute the inputs to the stakeholders' interactive workshop.

Major problems encountered were getting respondents for interview at scheduled times and venues. Many of the respondents were not available at the earlier agreed times either because they were busy with other activities; they forgot about the appointment or the environment was not conducive (e.g. too much heat occasioned by harsh weather and power outage). This had made the one week time frame earlier scheduled for the interview inadequate in addition to causing some logistics problems in terms of fixing new venues as well as convenient times. All these combined to add cost of the study. To address these problems in the subsequent study therefore, questionnaires were sent to respondents well ahead of time and interviews started from the commencement of the study to the end, and for each main study College, two weeks were dedicated to interviews only, on the study programme, as opposed to the one week period dedicated during the pilot.

Questions prepared for the semi structured interviews (*Appendix E*) had served well in guiding the interviews which were semi structured.

Data analysis

Data for analysis was obtained from analysis of existing document, physical survey of facilities and interviews/group discussions. These included interview tapes/transcripts, observation field notes, notes on interview context and process, etc. The analysis involved summarizing the mass of data collected and presenting the results in a way that communicates the most important features. This exercise was concurrent with data collection and it is an on-going exercise. Detailed discussion on the data analysis is given in section 6.6.

Interactive workshop

As earlier stated, an interactive workshop was conducted with the stakeholders on 15th September 2005, instead of 9th September as earlier scheduled. The change of date was occasioned by the unexpected temporary closure of the college as a result of students' unrest, two days to the earlier scheduled date. The workshop was the last activity scheduled for the pilot study and was aimed at:

- Sensitizing Stakeholders on the need for the colleges to develop Asset Strategy;
- Identifying critical areas that the proposed Asset Strategy needs to address;
- Generating alternative/complimentary data;
- Identifying problems that might hinder the effective development of Asset Strategy;
- Strengthening/modifying research instruments;
- Initiating process of change;
- Identifying harmonious strategies for developing the asset Strategy;
- Empowering Stakeholders to initiate, execute and manage the required reforms for effective realization of college corporate goals; and
- Providing in a participatory manner, an avenue for consulting with Stakeholders on how to effectively design and implement the asset strategy.

Workshop Procedure

The workshop was organized in collaboration with stakeholders in a participatory manner. The workshop used the 'Problem Tree', the 'Action Sheet' and the SWOT (Strength, Weakness, Opportunities and Threats) analytical framework. The former entailed participants identifying the root causes of identified problems, their consequences, opportunities, options available for addressing the problems, as well as the likely threats to effecting change. The SWOT analysis, on the other hand, entailed participants identifying the Strengths, weaknesses, opportunities, and threats to identified options (examples of these analyses are given in the appendix). This way, the workshop participants brainstormed on the issues that needed to be addressed before a viable Asset Strategy can be developed.

Participants

The workshop was attended by the major stakeholders. There was an observed cordiality and enthusiasm amongst all participants, irrespective of their status. A representative of the NCCE who had earlier agreed to participate could not however attend, due to the sudden change of date for the workshop. Participants included:

- Principal Officers: Provost, Registrar, Librarian, Bursar and Head of Estate
- Two professionals from Estate Department
- A staff of the Bursary
- The Student Affairs officer
- Two representatives of the academic staff
- A representative of the non academic staff
- Two representatives of the student body

A very important group that should have been represented at the workshop but was not invited is the representatives of the community in which the college is located. This group is invariably impacted by the college and ought to have participated and make their contributions to the development of the strategy. Subsequent studies however, did involve such groups.

Workshop programme

The workshop focused on three main issues namely:

- 1 Presentation of asset strategy concept and the pilot report
- 2 Examination and review of the pilot report
- 3 Presentation and critique of the interim Asset Strategy model

Workshop Programme

TIME	ACTIVITIES	ACTION LINES	EXPECTED OUTCOME
9.00am – 9.30m	Opening formalities	<ul style="list-style-type: none">▪ Introduction▪ Keynote presentation by, Provost of the college	
9.30am – 10.30 am	Presentation of concept paper and pilot report	<ul style="list-style-type: none">▪ Presentation of concept paper and the pilot report by the researcher▪ Moderation by Dean, School of Education	<ul style="list-style-type: none">▪ Familiarization of participants with concept of asset strategy and modalities for its development▪ Familiarization of existing and required assets and facilities▪ Set the tone for subsequent discussions
10.30am – 10.45am	<i>T E A</i>	<i>B R E A K</i>	
10.45am – 11.30 am	Discussion of the concept paper and the pilot report	<ul style="list-style-type: none">▪ Chaired by the Head of Estate Department▪ Contribution by participants▪ Moderation by Dean School of Vocational Education	<ul style="list-style-type: none">▪ Enable a critique of the presentation, provide clarification for on areas of doubt
11.30 am – 12.30pm	Review of existing facilities	<ul style="list-style-type: none">▪ Chaired by the Chairman of Academic Staff union▪ Moderation by the Chairman of Non Academic Staff union	<ul style="list-style-type: none">▪ Full appreciation of the existing and required assets and facilities that will meet service delivery requirements▪ Appreciation of the need for an asset strategy and set tone for discussion of the interim model
12.30pm – 1.45pm	<i>L U N C H</i>	<i>B R E A K</i>	
1.45pm	Presentation of the interim Asset Strategy model	<ul style="list-style-type: none">▪ Chaired by the Registrar of the college▪ Presentation by the researcher▪ Moderation by Head of Estate Department	Familiarization with the interim model,
1.45pm – 2.45pm	Critique of the interim AS model	<ul style="list-style-type: none">▪ critique of the proposal by participants	Better understanding of the interim asset strategy model and inputs for improving the model
2.45pm	<i>C L O S I N G</i>		

Table 6.1 Pilot Study Interactive Workshop Programme Source: Field Study

Workshop Outcome

The out come of the workshop can be summarized as follows:

1. A better understanding of the existing and required assets and facilities that can meet the present and future service delivery requirements of the College – interim report on College corporate goals, current and future service delivery requirements and assets and facilities data obtained through the instruments of

document analysis, physical survey and interviews were discussed and areas of ambiguity cleared. Critical areas were also identified along with opportunities for improvements. At the end of the day both the researcher and the participants were better informed.

2. An understanding and appreciation by participants, of the need to develop Asset Strategy for the College – the workshop was used as an avenue to sensitize participants on the need to develop a long term plan for the development and management of assets and facilities in an optimum way in relation to the college's academic and business needs. Participants appreciated that developing an asset strategy is the best way of effectively and efficiently marching assets and facilities to their service delivery requirements as the strategy is based on an analysis of assets and facilities, the academic plan, current resources and future opportunities.
3. Enhancing collaboration between the College Management, Staff and students, especially in initiating, developing and institutionalizing asset strategy for the College – there was an active participation by all. The existing power relations between and among participants was broken which provided a stimulating environment for open and honest discussions on all issues. The workshop participants were sufficiently motivated by actively engaging them in the entire process and that is likely to make them see the innovation (asset strategy) as their product and its success theirs
4. Initiating process of change - the approach to asset strategy development discussed at the workshop operate through a focus on participative process where those involved define and address needs which brings about changes in management of college assets
5. Concretizing/enhancing research instruments for the fieldwork – the workshop had provided the researcher an opportunity to reassess the research instruments to make them more relevant to the study. Accordingly, additions and deletions in respect of the list of documents that needs to be accessed and analyzed, physical facilities to be observed and interview questions has been effected.
6. Strengthening the asset strategy model – the interim asset strategy model had been strengthened by some minor adjustments occasioned by observations made by participants.

General Outcomes of the pilot study

At the end of the pilot study, the researcher had among others, been able to:

1. Identify the College corporate goals and objectives – This has been achieved through document analysis and interviews.
2. Identify assets and facilities needs that are necessary for the achievement of these goals – Through document analysis, interviews and workshop, current and projected student and staff population; the various types of academic programmes run by the college; minimum standards imposed by regulatory bodies for facilities, and the state of the existing assets and facilities
3. Identify problems of the assets/facilities, prospects and opportunities for improvement - All assets and facilities were inspected, assessed and graded in order to determine their availability, ownership, age and physical condition. During interviews and workshop problems, prospects and opportunities for improvement were identified.
4. Determine the level of knowledge and application of Asset management principles and tactics by the college.
5. Confirm that the developed instruments can indeed be applied in the main study, with only some minor improvements – At the end of the exercise, it was clear that the developed instruments and the model could be successfully employed in the subsequent studies with only some minor adjustments.
6. Identify potential practical problems in following the research procedure – The pilot had afforded the researcher an opportunity to predict some constraints that could be encountered during in the course of the main studies. The summary of some of the identified constraints are given in the next section.

Constraints to application of study instruments

The study instruments were generally considered as satisfactory for generating the required data for the study and same can be applied for the main study with some minor improvements. An interactive workshop was conducted in place of the earlier planned VM workshop. This was informed by the need to employ strategy that stakeholders are very much familiar with in order to maximise the benefits of the workshop. Some constraints were however observed during the pilot, which were then taken into consideration in the subsequent study. These include:

- Absence of Governing Council – the College Governing Council had just been reconstituted and was not even inaugurated when the study was conducted, there was no inputs from such important body, hence full implementation of the strategy cannot be guaranteed.
- The College was temporarily closed down during the study period, as a result of student riot. Such closures, occasioned by student riots or staff strikes are very common in the Nigerian institutions of higher learning and mostly occasioned by government's inability to meet certain agreements reached with either students or staff. Alternative arrangement was therefore made for the main study so that the researcher would always go to another College if earlier identified College is closed down.
- Poor record keeping – it was observed that the Colleges were just beginning to introduce use of computers for record keeping. Data are very scanty and management of same, very poor. Records on exact dates and reasons for procurement of assets, dimensions of buildings, extent and dates of maintenance of buildings, were observed to be inadequate. Where particular document could not provide sufficient information however, emphasis were placed on observation and interviews
- Information on finances – College officials were not very much willing to provide enough information regarding revenues and financial expenditures. This however did not constitute much problem as the purpose of the study is only to provide guidance to the Colleges to be able to develop their own strategies by themselves.
- Out-Sourcing of Services – Out-sourcing of some FM services such as cleaning, gardening, security, catering, etc will ensure efficiency, effectiveness and cost savings. Its introduction will obviously require laying off a lot of staff who might not be needed for the attainment of college goals. This action, desirable as it is however, will have a lot of political implications. The College will therefore have to be extremely careful in handling such issues.

At the end of the pilot study, the researcher returned to Leeds for consultations before the commencement of the main studies, whose procedure are discussed in the subsequent sections.

6.3 The main Studies

The main objective of the pilot study as earlier stated, is to pre-test the study instruments that have been developed for the main field studies. After a successful conduct of the first phase (*pilot study*) therefore, and having being satisfied with the reviewed model and study instruments, the researcher commenced the main studies which involved three Federal Colleges of Education; one each from the three former geopolitical regions of Nigeria – Northern, South-Western and South-Eastern region, respectively. Sampling methods used in the selection of the case study colleges have been earlier discussed in *chapter 5*.

6.3.1 Field Work Phase Two

The second phase of the field visit involved studies in one of the main case study colleges in the South Eastern region of the country. It commenced on the 7th November 2005 and lasted up to 20th January 2006. The college is classified as relatively small in terms of its student and staff population and the number of academic programmes provided.

The College authorities showed tremendous willingness to benefit from the study and therefore gave maximum cooperation towards the success of the exercise. Data were collected as done during the pilot study, after which an interactive workshop involving 14 participants was conducted to verify the results and sensitize participants on the need to develop structured policy for the effective and efficient management of College assets.

6.3.1.1 Process of Data Collection

As in the pilot study, the researcher used a triangulation of instruments, involving examination of documents, observation of physical facilities and interviews for the purpose of collecting necessary data. This is a common practice with case study research, in order to strengthen the data. It is also aimed at achieving credibility for the research findings. Since the meanings of the social world are dynamic, the use of

different methods can help overcome the intrinsic bias that is bound to come in case studies. Accordingly, this study used document analysis, observations and interviews. During the main field studies, questions were asked relating to the enablers which were identified from the literature as the basic principles for effective and efficient management of assets. Data from the main studies were analyzed in a manner that largely mirrors the procedure adopted in the pilot study stage. Data was presented under emerging theme groups, for each college studied, with interim asset strategy model as the main guide.

As in the case of the pilot study, observations and interviews were the principal tools, while documents were used as a springboard to interviews and observations. The procedure adopted for document analysis is given in *Table 6.2*.

Objective(s): To further strengthen the researcher's understanding of:

- Relevant points in corporate plan which influence assets and facilities;
- Targets, such as projected academic programmes & student numbers, to determine assets and facilities requirements;
- Assets data: numbers, age, sizes, condition, use, tenure, value, etc, to determine fitness for purpose, space utilisation, and adequacy of assets in meeting current and projected requirements;
- What assets and facilities the college plans to develop in order to meet its service delivery requirements and the likelihood of achievability;
- Level of knowledge assets own and rented by the college
- Funding for planned projects and whether development plan is consistent with corporate objectives and academic plan;

Reason for choice: It was necessary to back up information received from the interviews with other sources of data. The analysis of documents allowed the researcher to draw specific information and gain more insight into issues raised by interviewees. It also allowed the researcher to distinguish between information applicable to all colleges from that subject to the interviewees own college experience.

Sampling method: The documents analyzed were from four main sources:

- College general management/policy documents such as: Decree establishing the

college; Corporate goals and mission statement; Academic plan; staff development plan

- Physical facilities development/management/maintenance related documents such as: maps; Building plans & photographs; Asset Register; Information on tenure of buildings; Capital development and Maintenance plans;
- Academic development/management related documents such as: - Current and projected student & staff population; Number of academic programs; Central Time table
- Finance related documents such as: Budgets; grants; Local revenue generation; Valuation reports

Table 6.2 Research Study Document Analysis Procedure

Observation

Physical assessment survey on all assets and facilities in the college were successfully conducted as in the pilot study. The observation had helped the researcher in gaining insights into what was on ground and that became very useful in content of questions during interviews that were conducted thereafter, and also in understanding the context within which interviewees respond to researcher's questions.

Condition of buildings and fitness for purpose were accordingly graded in accordance with the earlier stated RICS maintenance definitions given in appendix B. Factors considered in grading fitness for purpose include: room sizes, location, furniture, environment, fittings and equipment. The observation procedure is given in Table 6.3.

- **Objective(s):** To further strengthen the researcher's understanding of the physical condition, functionality, and fitness for purpose of all physical facilities and the utilization of same
- **Reason for choice:** It was necessary to back up information received from the interviews with other sources of data. The physical inspection allowed the researcher verify what is obtained in the documents earlier analyzed and also to draw specific information and gain more insight into issues raised by interviewees
- **Sampling method:** All existing physical assets/facilities were examined
- **Administration Procedure:** Each physical asset/facility was inspected and broadly appraised to ascertain the extent to which it meets its service delivery requirements. Field notes were taken to record the physical condition as well as fitness for purpose for each asset/facility. Some photographs were also taken.
- **Presentation of results:** Condition of buildings were accordingly graded A, B, C, & D according to RICS maintenance definitions, while fitness for purpose for each building was accordingly graded as good fit; above average; below average; and poor. Factors considered in grading fitness for purpose include: room sizes, location, furniture, environment, fittings and equipment.

Table 6.3 the procedure for physical observation/inspection of assets and facilities

Interviews

Semi structured interviews and group discussions were conducted in same way as in the pilot study. The interviews were tape recorded and later transcribed and analyzed. Results were further analyzed along with the document analysis and the physical observation results. All these were to later constitute the inputs to the stakeholders' interactive workshop. Procedure for the interviews is given in Table 6.4:

- Objective(s):**
- To identify the strategic objectives of the College, which is crucial to asset strategy; highlight relevant points that influence provision of assets and facilities;
 - Identify the asset/facilities needs that are necessary for the attainment of College corporate objectives.
 - Identify gaps between existing and required assets for meeting service delivery

requirements and factors responsible for the gaps;

- To identify necessary collaborative arrangements and other non asset solutions with a view to optimizing the use of scarce college resources;
- Identify the general impression of respondents about the effectiveness and efficiency of the College assets and facilities their general recommendations on bringing about improvements;
- Determine college's level of understanding of assets own and Asset Management practices;
- Complement the literature review and fill in uncovered gaps in knowledge.

Interview type: The information required at this stage was general in nature, thus requiring open-ended questions. This necessitated the use of unstructured interviews which allowed participants more freedom to talk about the topic. It also enabled the interviewer to pick up particular "leads" that were worth following up.

Sampling method: 28 respondents were interviewed. These includes Principal Officers (Provost, Registrar, Librarian, Bursar and Head of Estate), professionals from Estate Department, staff of the Bursary, the Student Affairs officer, representatives of the academic staff, representatives of the non academic staff and representatives of the student body

Administration procedure: An interview schedule was developed beforehand and topics tested/modified during pilot studies. The interview schedule was used as an *aide-memoir* and also as a starting point.

Presentation of results: A sample list of interview questions and a summary of the interview scripts are presented in appendix E.

Table 6.4: Phase 2 Field Study Interview Procedure

Verification Workshop

Following the collection of data an initial processing of obtained data and problem structuring took place. This was then followed by an interactive workshop aimed at verifying findings, sensitizing participants on the importance of developing asset strategy and strengthening the strategy model. The workshop, conducted as earlier discussed in Section 6.2.1, was attended by the major stakeholders, including

principal officers of the College, members of academic and non-academic staff, students and representatives of the community where the college is located. The procedure adopted for this verification workshop is presented in Table 6.5.

- **Objective(s):**
 - To verify the researcher's understanding of the research problem, and ensure an accurate understanding of the college activities and physical facilities.
 - To sensitize stakeholders on the need for the college to develop a structured policy that ensures effective and efficient management of assets and facilities
 - To allow for feedback, and point directions for future stages.
 - To generate alternative/complementary data
 - To confirm/modify the interim Asset Strategy Model
- **Sampling method:** An invitation was given to the major stakeholders, most of who participated during the data collection exercises. Fourteen people, including principal officers, staff of Estate and Bursary departments, academic and non academic staff, students and representatives of the college host community accepted the invitation and participated actively in the workshop:
- **Administration procedure:** The workshop was scheduled for a morning session, followed by a lunch, then a brief concluding session. A summary presentation was given at the start of the workshop. Questions were then invited from participants, during the morning session. In the afternoon, an open discussion session was conducted to encourage participants to challenge the findings and modify the Asset Strategy Model.
- **Presentation of results:** Table 6.6 gives a summary of workshop outcome, while chapter 7 summarizes all finding relating to the effective and efficient management of assets and facilities in the colleges and modification of the Asset Strategy Model.

Table 6.5 Phase 2 Study Verification Workshop Procedure

The information obtained at the end of the phase 2 study has been summarized and presented in Table 6.6.

The workshop identified a number of factors that contributed to the inadequacy and poor condition of college assets. These include poor funding, sharp rise in student enrolment without corresponding expansion of physical assets, insufficient maintenance budgets and lack of properly structured assets policy. The workshop also discussed the poor state of public utilities and the high cost of generation of power and provision of water locally. Suggestions were then made on how to address these important issues. After an exhaustive deliberation, the workshop adopted the interim report and the interim asset strategy model.

Table 6.6 Summary of Results from Feedback Workshop at the 1st main study College

6.3.2 Field Work Phase Three – Study in the remaining two Main Study Colleges

The third phase of the field work took place between 27th March and 16th June 2006. It involved studies in two main case study colleges. One is a relatively large College in terms of population and number of academic programmes offered and it is located in the northern geo-political region of the country. The other, classified as medium, is located in the south western region of the country.

A similar study to those conducted during the previous field work exercises was therefore undertaken in the two colleges. Choice of these colleges was based on purposive sampling as earlier discussed in *Chapter five*.

The first and second phases of the field studies had given the researcher a remarkable insight into what to expect in respect of the third phase. Some relevant aspects of the previous studies with implication for phase three of the studies include:

- ***Study instruments*** – these have been developed and successfully applied in the previous studies. Experience gained by the researcher had therefore made application of the instruments in subsequent studies much easier.
- ***Collection of preliminary data*** – given that the colleges are all established by same Government and for same purpose and that NCCE regulates activities of all colleges, a lot of the required data are common to all. These includes corporate goals, management structure, academic requirements, space standards, funding,

budget procedure, students and staff residence policies, etc. These data collected from the previous studies were therefore applicable to the third phase of the studies, thereby saving time cost and other logistics.

- **Condition of facilities** – because many factors that impact on physical facilities of the Colleges are similar, the conditions and performance of these facilities also seems to be similar in all Colleges. What the researcher expected in the colleges at the commencement of the third phase of the studies, in terms of condition and performance of physical facilities were therefore not be too far from what is obtained in the previous colleges studied.
- **Constraints** – major constraints observed in the two earlier studies are common. During the third phase of the study, the researcher had already therefore expected similar constraints such as poor record keeping and unwillingness by College authorities to provide sufficient information on their finances.

Data Collection Procedure

Procedure for data collection is very much similar to that of the previous studies. In each of the two Colleges, data was collected by means of document analysis, physical inspection of assets and facilities and interviews/group discussions. Similarly, in the case of each College, interactive workshop was organized to verify findings and confirm/modify the earlier developed interim asset strategy model. It was also a forum for the sensitization of participants on the need for the Colleges to develop structured policy for the effective and efficient management of their assets. A detail of findings from the colleges is discussed in *Chapter 7*, while procedure for interviews for the third phase of the field study is given in Table 6.8.

- **Objective(s):**
 - To further investigate the strategic objectives of the Colleges, which are crucial to the proposed asset strategy and highlight relevant points that influence provision of assets and facilities
 - To determine the future direction of the colleges as defined by its strategic objectives and the assets/facilities needs resulting from these

- To identify the scope of the existing assets and facilities, their capacity and fitness for purpose in meeting service delivery requirements
- To understand how effective and efficient assets and facilities are managed and compare to what is obtained in the previous colleges studied, to determine level of understanding of the principles of asset management.
- To understand the skills and competence of the estate dept staff in the Colleges and compare with other colleges studied with a view to identifying necessary training programmes
- To identify the general impression of respondents about the effectiveness and efficiency of the College assets and facilities their general recommendations on bringing about improvements, with a view to strengthening the Asset Strategy Model
- **Interview/Questionnaire type:** The information required at this stage of the research was starting to have a specific focus. Semi-structured interviews were therefore chosen as they focused the discussion, whilst allowing for further explanation and probing. The accompanying questionnaire was open-ended to allow for filling gaps in information obtained at the interview sessions.
- **Sampling method:** As in the previous studies, purposive sampling was used. In each college, a total of 28 persons, including principal officers, lecturers, estate and bursary staff and students were interviewed. The selection done to target those who could provide the right information.
- **Administration procedure:** A questionnaire was used as a guiding framework to accompany the interview session. It also served to complement questions that were not covered during the session due to time limitations. The questionnaires were sent in advance to allow participants to prepare and were collected on the interview day whenever possible. This ensured a higher return rate than would normally be expected from postal questionnaires. Additionally, the interviews were tape recorded to ensure that the researcher concentrates on asking questions, and does not miss any crucial replies.
- **Presentation of results:** a sample of interview questions and a sample of summary notes from interview transcripts are presented in appendices E

Table 6.7 the Phase 3 Study Interview Procedure

Verification Workshops

As earlier discussed, interactive workshops, similar to the ones organized in the colleges previously studied, were conducted in each of the two case study colleges involved in this third phase of the fieldwork. The workshop procedures for the two colleges studied under phase three and summary of workshop outcomes for each of the two colleges is respectively given in Tables 6.8, 6.9 and 6.10.

- **Objective(s):**
 - To achieve an interactive exchange of information with stakeholders in order to give the study a practical edge.
 - To feedback preliminary findings to stakeholders and verify the researcher's understanding of the College activities, its assets and how they are managed, especially the level of College understanding of their assets/facilities and their level of competence in asset management
 - To strengthen the interim asset strategy model
- **Sampling method:** For each College, an open invitation was given to all interview participants to attend the workshop. 15 participants attended the workshop in the first college of the phase three study while 13 attended in the case of the second college
- **Administration procedure:** In each case, the workshop was scheduled for three hours. At the beginning of each workshop a presentation was made to the participants, summarizing findings and research progress to date. Following the presentation, participants were encouraged to challenge the findings, provide additional information and suggest improvements to the model.
- **Presentation of results:** Findings from the Workshops and a sample of summarized discussions are presented in Tables 6.9 and 6.10

Table 6.8, Phase 3 Study Verification Workshops Procedure

The second case study College was going through similar challenges as the pilot and first case study Colleges. The workshop was therefore focused on the inadequacies in the current practice in asset management and needs for the new

approach. A number of issues evolved from the discussion which included need to improve IT facilities, classroom and laboratory accommodation, student and staff residences and local revenue generation. The Interim Strategy model was examined and adopted as model that if used by the College is capable of addressing problems associated with asset needs.

Table 6.9, Summary of Results from Feedback Workshop at 2nd Main Case Study College

The third case study College also faces similar challenges as the previous Colleges studied. They range from inadequate accommodation, old and dilapidated buildings, unsuitable buildings, erratic power supply, poor funding, to issues relating capacity building for estate staff, improvement of sports facilities, collaborative arrangements with other organizations and improvement of local revenue generation. On the interim model, participants expressed satisfaction and noted its potential to bring about improvement in the effective and efficient management of assets and facilities in the College.

Table 6.10 Summary of Results from Feedback Workshop the 3rd Case Study College

6.4 Data Analysis Procedure

Qualitative data usually consist of the words or actions of participants. These data can be difficult to condense and organize without losing their meaning. Analysis of qualitative data requires considerable creativity on the part of the researcher. It involves summarizing the mass of data collected and presenting the results in a way that communicates the most important features.

During the various stages of the study, interview transcripts, findings from document analysis and observations produced a rich and voluminous amount of data. Due to the qualitative nature of this data the grounded theory approach, discussed in *Chapter five*, was seen to be appropriate due to the reasons given in the said *Chapter five*.

The process utilized during the field studies, based on the grounded theory approach is illustrated in Figure 6.2. The process involved studying the raw data obtained from interviews, questionnaires, documentation and an interactive feedback workshop at each individual college to arrive at emergent categories. From the emergent categories, a cross-case analysis was undertaken. How the colleges understand and manage their assets and the more general problem areas that impede the efficient and effective management of assets in the Colleges studied were identified. These categories were presented at the verification workshops as the basis for the discussion to arrive at a consensus regarding the key priority requirements for the asset strategy model, which reflect the needs of the stakeholders for a revised approach to the management of assets and facilities to improve effectiveness and efficiency.

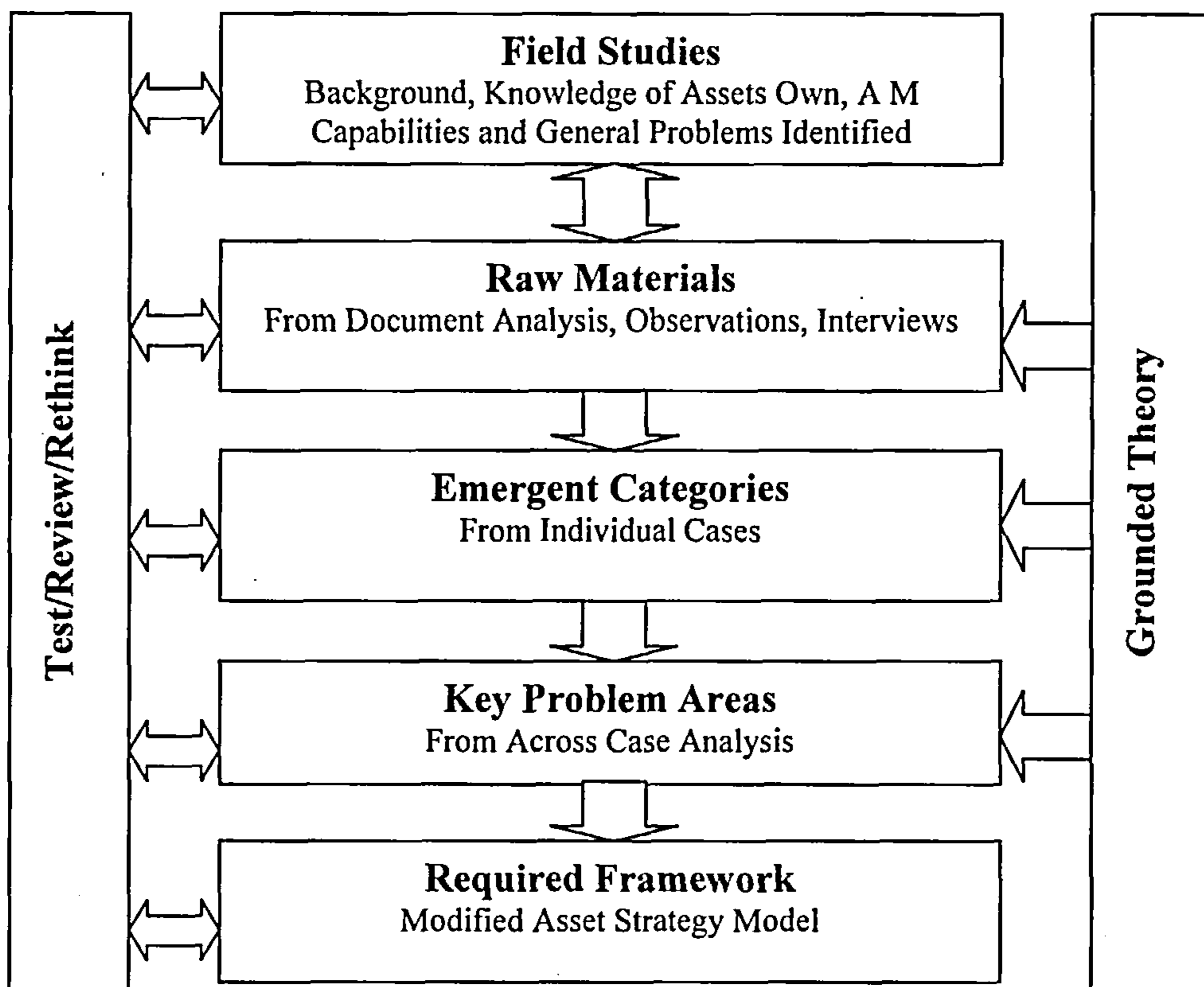


Fig 6.2 Data Analysis Procedure: Author 2007

Qualitative modes of data analysis provide ways of discerning, examining, comparing and contrasting, and interpreting meaningful patterns or themes. Meaningfulness is determined by the goals and objectives of this research. In quantitative analysis,

numbers and what they stand for are the material of analysis. By contrast, qualitative analysis deals in words and is guided by fewer universal rules and standardized procedures than statistical analysis.

In qualitative evaluation, data collection and data analysis are not temporally discrete stages: as soon as the first pieces of data are collected, the researcher began the process of making sense of the information. It should be stressed that in this research, analysis began almost in tandem with data collection, and that it is an iterative set of processes that continued over the course of the field work and beyond. Moreover, the different processes involved in qualitative analysis also overlap in time. Part of what distinguishes qualitative analysis is a loop-like pattern of multiple rounds of revisiting the data as additional questions emerge, new connections are unearthed, and more complex formulations develop along with a deepening understanding of the material. Qualitative analysis is fundamentally an *iterative* set of processes.

Basically, the data analysis involved examining the assembled relevant data to determine how they answer the questions set by the objectives of this research. Throughout the course of the data analysis, the researcher was asking and re-asking a number of questions such as:

- What patterns and common themes emerge in responses dealing with specific items? How do these patterns (or lack thereof) help to illuminate the broader study questions?
- Are there any deviations from these patterns? If yes, are there any factors that might explain these atypical responses?
- What interesting stories emerge from the responses? How can these stories help to illuminate the broader study questions?
- Do any of these patterns or findings suggest that additional data may need to be collected? Do any of the study questions need to be revised?

Two basic forms of data analysis, essentially the same in their underlying logic was carried out: *intra-case analysis* and *cross-case analysis*. A case is a single College. Intra-case analysis will examine a single College, and cross-case analysis systematically compared and contrasted the three colleges.

In the process of making sense of the data, this research had adopted the framework developed by Miles and Huberman (1984) to describe the major phases of data analysis: data reduction, data display, and conclusion drawing and verification.

Data Reduction: First, the mass of data had to be organized and somehow meaningfully reduced or reconfigured. Miles and Huberman (1984) describe this first of their three elements of qualitative data analysis as data reduction. "Data reduction refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written up field notes or transcriptions." Not only do the data need to be condensed for the sake of manageability, they also had to be transformed so they could be made intelligible in terms of the issues being addressed.

Data reduction often forces choices about which aspects of the assembled data should be emphasized, minimized, or set aside completely for the purposes of the research. In this project, the researcher did not make any vain effort to remain "perfectly objective," by presenting a large volume of unassimilated and uncategorized data for the reader's consumption. In qualitative analysis, the analyst decides which data are to be singled out for description according to principles of selectivity. This usually involves some combination of deductive and inductive analysis. While initial categorizations were shaped by pre established study questions, the researcher remained open to inducing new meanings from the data available. The process of data reduction adopted by the researcher can be summarized as follows:

- Look at document, such as field notes, interview transcripts
- Look for indicators of categories in events and behaviour - name them and code them on document
- Compare codes to find consistencies and differences
- Consistencies between codes (similar meanings or pointing to a basic idea) reveal categories. So need to categorize specific events
- Memo on the comparisons and emerging categories
- Eventually category saturates when no new codes related to it are formed
- Eventually certain categories become more central focus - axial categories and perhaps even core category.

In this analysis, data reduction was guided primarily by the need to address the stated study objectives of how the Colleges understand and manage their assets; existing problems and how to improve effectiveness and efficiency in the management of college assets. This selective winnowing is difficult, both because qualitative data is very rich, and because the researcher played a direct, personal role in collecting them. The words that made up qualitative analysis represented real people, places, and events far more concretely than the numbers would have been in quantitative data sets; a reality that made cutting any of it quite painful. But the acid test had to be the relevance of the particular data for answering particular questions. The approach to data reduction is the same for intra-case and cross-case analysis.

Data Display: Data display is the second element or level in Miles and Huberman's (1994) model of qualitative data analysis. Data display goes a step beyond data reduction to provide "an organized, compressed assembly of information that permits conclusion drawing..." A display can be an extended piece of text or a diagram, chart, or matrix that provides a new way of arranging and thinking about the more textually embedded data. Data displays, whether in word or diagrammatic form, allow the analyst to extrapolate from the data enough to begin to discern systematic patterns and interrelationships. At the display stage, additional, higher order categories or themes emerged from the data that go beyond those first discovered during the initial process of data reduction.

From the perspective of evaluation, data display in table, charts, for both intra-case and cross-case analysis was extremely helpful in identifying the situation of assets in the Colleges. The researcher could discern patterns of interrelationships to suggest condition of assets and their management in the Colleges.

Conclusion Drawing and Verification: This activity is the third element of qualitative analysis. Conclusion drawing involves stepping back to consider what the analyzed data mean and to assess their implications for the questions at hand. Verification, integrally linked to conclusion drawing, entailed the researcher revisiting the data as many times as necessary to cross-check or verify these emergent conclusions. Miles and Huberman (1994) observed that "the meanings emerging from the data have to be tested for their plausibility, their sturdiness, their 'confirmability' - that is, their validity". Validity means something different in this context than in

quantitative evaluation, where it is a technical term that refers quite specifically to whether a given construct measures what it purports to measure. Here validity encompasses a much broader concern for whether the conclusions being drawn from the data are credible, defensible, warranted, and able to withstand alternative explanations.

The researcher had now begun to develop a reasonably coherent explanation for the situation of the assets, their objectives and how they are managed by the various colleges. Arriving at this point required stepping back and systematically examining and re-examining the data, using a variety of what Miles and Huberman (1994) call "tactics for generating meaning." They describe a number of such tactics, including noting patterns and themes, clustering cases, making contrasts and comparisons, partitioning variables, and subsuming particulars in the general. Qualitative analysts typically employ some or all of these, simultaneously and iteratively, in drawing conclusions.

To verify the validity - or truth value - of the interpretation of the data, Miles and Huberman (1994) again outlined a number tactics for testing or confirming findings, all of which address the need to build systematic "safeguards against self-delusion" into the process of analysis. However, it is very important to stress at the outset: several of the most important safeguards on validity - such as using multiple sources and modes of evidence – had been built into the research design from the beginning.

The next chapter (*Chapter 7*) therefore relates literature reviews of *Chapters 2 & 3* to the field study activities. Key results of the study are also presented while the asset strategy model modified to make it more adoptable and relevant to the prevailing situation in the Colleges.

6.5 Conclusion

This chapter discussed the general activities involved in the field studies, which was conducted in three phases, spanning a period of ten month. The first phase was the pilot study, conducted with the aim of pre-testing the study instruments. This was followed by main studies in three other Colleges, conducted in two batches.

The process of data collection and analysis was also discussed. The studies being exploratory in nature, requires qualitative approach. Thus, a holistic grounded-theory based methodological process was adopted as it acknowledges and facilitates the study characteristics. This method which involves a triangulation of data collection and methodology approaches ensures the validity of data on which the emergent theory is based. A chronological sequence of events in the implementation of the adopted research methodology was then presented outlining the objectives, reasons for choice, and administration procedures for each stage. This included the iterative process of feedback and verification which is a central part of the adopted methodology.

The field studies, conducted in line with aims of the study as outlined in *chapter one*, and adopting the qualitative research methodologies as in *Chapter five*, has successfully raised awareness of stakeholders in on the need and the processes of the developing asset strategy for each College. This resulted in active participation of stakeholders is development of a contextualized model as given in *Chapter 7*.

CHAPTER SEVEN

DISCUSSION OF RESULTS, REVIEW AND VALIDATION OF ASSET STRATEGY MODEL

7.1 Introduction

The previous chapter discussed processes of the field studies and analysis of the data obtained from the studies. This chapter is therefore presented in two main sections. In the first section, results from the field studies are presented and discussed. The first review of the interim asset strategy model, based on the field studies is also discussed. The second section discusses the research validation exercise and the final modification and evaluation of the Asset Strategy Model. This chapter also concludes with provision of a modified asset strategy model and responsibilities for the development of asset strategy by individual Colleges.

7.2 Presentation and Discussion of Results and Review of Model

In this section, results of the field studies conducted as in the previous chapter is presented and discussed. Also the qualitative data extracted from the existing Asset Management and the related Estate and Facilities Management theories (*Chapters 2&3*), and from the field studies (*Chapter 6*) are analyzed and appraised. The objective of this exercise is to confirm the existing literature and the asset strategy model, and to also facilitate any necessary extension or additions by:

- establishing the degree of correlation between the existing theory and the data presented in the field study report (to confirm)
- identifying and articulating any relevant data contained within the field study not reported in the current literature (to facilitate extending)

The field study data is also analyzed to establish the context within which the asset strategy model was developed, a requirement of the case study approach to data collection as discussed in *Chapter 5*

7.2.1 Field Study Results

The field study data obtained from document analysis, observations, interviews and subsequent interactive workshops had been analyzed as earlier discussed in *Chapter six*. Findings from the field studies are therefore summarized as follows:

Stakeholder interest in the study – In all the Colleges studied, the stakeholders have demonstrated sufficient interest in the study. This is evidenced by their active participation in the whole exercise. The active support and cooperation can be attributed to the new trend whereby public organizations are embracing management concepts from the private sector which ensures that public expectations are matched with an efficient use of limited resources and also their desire to develop a system that can bring about improvement in the way assets and facilities in the Colleges are managed, especially given the high demand for services in the face of dwindling revenues.

Strategic Objectives - The Colleges have similar strategic objectives because they are established by same decree for same purpose. These objectives are:

- Teaching, encouragement of the spirit of inquiry and creativity in teachers;
- To produce highly motivated, conscientious, and efficient classroom teachers for the primary and junior secondary levels of the national educational system.
- To encourage and inculcate in teachers, the spirit of enquiry, creativity and pride and to enhance their commitment to national objectives.
- Provide a superior learning opportunity through progressive academic and administrative development that ensures the production of quality NCE teachers and prepares the Colleges for a degree awarding institutions to meet the overall teacher requirements for the nation.

Growth of Colleges – All the Colleges studied have been observed to have witnessed very sharp growth in staff and student population in recent years. This is attributable to the high demand for Teacher-Education, occasioned by government policy on the production of large number of teachers for primary and junior secondary schools.

Asset Objectives – The asset objectives of the Colleges are also common, and they include the following:

- Provision of suitable accommodation, which is fit for purpose and which provides an environment suitable for the institution to carry out its activities;
- Efficient use of space whether it be for dedicated departmental use or for general use;
- Value for money in terms of budgeting, specification, tendering and supervision of the estate including maintenance, running costs and building works;
- Flexibility in responding to opportunities with operational, financial or resource implications;
- A healthy and safe working environment;
- Developing an attractive asset portfolio of appropriate quality that will enhance the image and activities of the colleges;
- Protection and maximisation of the value of the assets in terms of existing and alternative uses;
- Economic, efficient and effective use of the assets.

Demand for Assets and Facilities – the sharp increase in population of the Colleges in recent years has not been sufficiently matched with corresponding increase in quantity and even quality of physical facilities. This has resulted in over-stretching of the existing facilities. There is therefore very high demand for additional facilities and also maintenance/remodelling of the existing ones, in all the Colleges.

Condition of Assets/Facilities – Most assets and facilities in all the Colleges, including academic and administration buildings, sports facilities, staff and student residences, central facilities, road, etc are in poor condition and therefore needs some form of maintenance or refurbishment/remodeling to meet demands of modern times and increasing student figures. Summary of the asset condition is given in appendix J

Asset Management Practice – The colleges had been observed to have progressively improved control over their assets by developing more reliable asset records and introducing better procedures for capturing asset transactions. However, it was noted

that the Colleges had yet to take a strategic approach to Asset Management. In particular:

- decisions on the purchase, operational use and disposal of assets had not been effectively integrated into strategic resource planning processes, for example, capital expenditure planning was still largely treated as a separate exercise;
- insufficient regard was observed to be given to alternatives to asset acquisition or ownership (i.e. non-asset solutions);
- the focus of asset decisions was the capital cost of an asset rather than the total life-cycle costs associated with its acquisition, use and disposal;
- the colleges lack structured maintenance framework to ensure that appropriate maintenance policies, strategies, systems and delivery mechanisms are in place to meet service delivery needs of the Colleges and to facilitate the development of maintenance strategic plan. In all Colleges studied, only reactive maintenance is undertaken, as funds permit
- disposal decisions were generally made in isolation from asset planning frameworks.

Space Utilization - The study of the Colleges revealed that most classrooms, lecture halls, laboratories and studios are grossly over populated. In some instances, students were observed to be hanging on windows during lecture sessions. In the schools of sciences however, some classrooms/ lecture halls have very low occupancy rate.

These problems can be attributed to the following factors, among others:

- the general inadequacy and poor state of academic buildings and furniture;
- poor record of academic space dimensions;
- decentralization of classroom/lecture hall control;
- bad fit between student numbers in class and room size;
- sharp rise in student enrolment
- low number of students offering science courses compared to those offering arts based courses, even as Government is placing more emphasis on the production of science teachers

Electricity and water supply – Public utilities in Nigeria are generally erratic and highly unreliable. The colleges are therefore faced with the burden of sourcing their own electricity and water to meet their demands. Providing these services is very expensive and therefore overstretches the lean resources of the colleges

Funding and Finances - A critical issue that needs to be addressed in order to successfully implement the proposed asset strategy is funding and proper management of College funds. The main source of funding for the College activities is Federal Government grants which has always been grossly inadequate to meet its capital investment and maintenance requirements. The Colleges are however, not willing to provide much information about their finances. This can largely be attributable to allegations of less transparent manner with which College finances are managed.

Internal generation of revenue – Opportunities for internal revenue generation has not been adequately exploited by the colleges.

College Management style – For each college, there is a Governing Council appointed to provide policy guidance, and Management Committee headed by the provost, who is the Chief Executive Officer of the College. The Management committee, whose other members include the Deputy Provost, Registrar, Bursar, Librarian and the Director of Works, is responsible for the day to day administration of the college. Both the Governing Council and the Provost are appointed by the President of the country. Their powers are defined in, and backed up by, Decree 4 of 1986. In all the colleges, the Works and Services (Estate) Department is responsible for physical planning and development of the Colleges, in consultation with the NCCE. It also carries the maintenance of the College assets and infrastructure, and sourcing and distribution of electricity and water. In each case, Works Department is headed by a director who reports directly to the Provost.

Training of estate staff - Like funding, skilled estate workforce is also very much critical to the success or otherwise of the asset strategy implementation. At the moment, the Colleges do not have structured policies or programmes for appropriate training of estate staff to update their knowledge and skills in order to make them more responsive to the new challenges. Individual staff members who wish to

improve their knowledge, and who gain admission into Universities or Polytechnics are however given sponsorship by the Colleges to pursue their training, as funds permit.

Factors responsible for asset gaps – Major factors that are responsible for the gaps between the required and the existing assets and facilities in the colleges have been identified. These include inadequate finance, lack of structured strategy for development and maintenance of assets and facilities, inadequate training for estate staff, poor management of finances, sharp and unrealistic rise in population, etc. General assets and facilities problems, opportunities and proposals have been identified as given in appendix K.

Level of Asset Management Application – The *IAM manual* identified attributes of good asset management which can be broken down essentially into two major groupings:

- Knowledge of the asset base at a strategic and tactical level
- Organizational Capabilities in asset management at a strategic and tactical level.

This sets an important parameter for deciding the scale of change an organization wishes to make on its journey to become a good practice organization in asset management. Positions of the Colleges in regards to asset management application were therefore assessed and it is clear that the knowledge of asset base of the Colleges is average while score for Colleges' capabilities in asset management is low.

Asset Strategy Model – The study has confirmed through interviews and interactive workshops that the asset strategy model has been very much appreciated and can indeed be adopted by the Colleges, especially in view of:

- The stated asset objectives of the College
- The current general trend in the country whereby public organizations are embracing management concepts from the private sector which ensures that public expectations are matched with an efficient use of limited resources
- Willingness of the Colleges to challenge the status quo in order to seek better ways of doing things.

- The simplicity of the strategy model, generally viewed as being very much user-friendly.

It is expected to bring about tremendous improvement in the management of assets and facilities, if adopted

Key Similarities between the Colleges

1. *Aims and Objectives of the Colleges* – These are same for all Colleges, as they are all established by same Government to operate under same policies and provide same services
2. *Condition of assets and facilities* – because many factors that impact on physical facilities of the colleges are similar, the conditions and performance of these facilities also seems to be similar in all Colleges.
3. *Management of assets and facilities; including Capital Investment, Maintenance and disposal decisions* – Unstructured and ad-hoc approach
4. *Power and Water Supply* – Very much erratic in all colleges. The Colleges therefore locally source for electricity and water supplies to meet their needs at very high cost
5. *Funding* – Same source; the Federal Government of Nigeria
6. *Staff Development*: No formal and structured programme for improvement of skills for the Works Dept Staff
7. *Land ownership* – The Colleges have about 95% freehold ownership of their lands and each College is located on a single compact campus.

Key Differences between the Colleges

1. *Focus of Individual Colleges*: while some Colleges lay more emphasis on running science based courses, others focus more on arts based courses. The implication here is that Colleges with more science students attract more funding from the Government because of its policy of producing more science students.
2. *Location*: Some Colleges are located in urban cities while other are located in semi urban or rural areas. Colleges located in the cities have the advantage of a better residential accommodation for staff and students from outside sources, better public transport services, better supply of public utilities, etc, than those located in the rural areas where such facilities and services are either not

available or grossly inadequate. Colleges in the cities also have the added advantage of opportunities for non asset solution to their service delivery needs. They can collaborate with other institutions, Government agencies, non governmental organizations, or even private establishments to get services as conference facilities, sports facilities, classroom spaces, etc. they also have a better chance of generating revenues locally through some commercial activities or consultancy services. All these may not be available to the rural colleges.

3. *Size of assets*: The Colleges have different numbers of physical assets. Older colleges have more number of academic programmes and population, therefore more numbers of physical assets.
4. *Population*: while student and staff population in all the Colleges is observed to be rising sharply, the figures are not same. The older Colleges are more populated.
5. *Management/staff/student relationship*: the way management, staff and students interact varies from one College to another, depending on the disposition of administrators in each college. While there seems to be cordiality and harmonious relationship in some Colleges due to the open, inclusive and transparent manner the management run the affairs of their college, others seems to run theirs with high handedness, resulting to mistrust, rancour, and strikes.
6. *Influence of immediate environment*: Environment in which the Colleges operate, such as cities or rural areas have great impact on colleges, particularly in respect of complementing College efforts in provision of alternative accommodation, sports and conference facilities, transport services, etc.

External Influences on the Colleges

1. *Federal Ministry of Education*: The Federal Government, through its Ministry of Education owns and funds the colleges. The ministry therefore provides the policy guidelines and dictates the operations of the Colleges through the appointment of the Provost and Governing Council.
2. *National Commission of Education (NCCE)*: NCCE receives funds from the Government and disburses same to the Colleges; sets standards for academic

programmes and physical developments; monitor and ensure College compliance of standards and all Government policies.

3. *Neighbouring communities*: Host communities in which Colleges have representatives in the college governing councils and therefore have influence on the policies and operations of the Colleges

7.2.2 Analysis and Appraisal of Existing AM, and the related FM and EM Theories

Relevant literature reviewed in chapters two and three describes asset management as the optimum way of managing assets to achieve a desired and sustainable outcome. The literature review, comprising more than 200 references has also shown that asset management activities extend from the identification of user expectations to the daily operations of the assets required to meet defined levels of service. It covers the procurement, operational management, maintenance, rehabilitation and disposal of assets such that their use is maximized in regards to their service delivery potentials and that risks and cost are managed over their entire life.

The literature review carried out reveal four key elements central to the role of asset management, and these include:

- Identification of needs for the asset, in the light of stakeholder requirements
- Provision of assets, including its ongoing maintenance and rehabilitation to suit continuing needs
- Operation of the asset
- Disposal of the asset when the need no longer exists or it is no longer appropriate for the asset to be retained.

The significance to any organization of the inter-relatedness of these four elements can be seen from the following three perspectives:

1. Defining and quantifying demand emanating from strategic business direction in terms of operational needs of assets and support services to core business activities;
2. Defining supply in terms of the necessary physical asset base and appropriate service levels from the delivery perspectives and their management over time;

3. Matching supply to demand over time as a continuous process of maintaining relevance in terms of an appropriate physical resource structure to support the corporate strategic intent.

Discussion of asset management in *Chapter two* indicated that it is commonly defined as the full life cycle management of such assets in order to maximize their advantage. It covers site acquisition and disposal, the replacement and remodeling of buildings, roads and bridges to include extensions and improvements, plus the management and maintenance of such capital infrastructure assets. From a financial standpoint, regard must also be made to the opportunity cost of such assets, i.e. the costs of having capital tied up in the asset rather than available for investment.

It has been argued that good asset management usually meets the following criteria:

- The organization knows what is in its asset portfolio, where those assets are and who is responsible for their upkeep (usually this means that each asset assigned a short asset statement: these are summarized into service asset statements which support the corporate asset management plan)
- The organization has developed a means of relating the assets in its portfolio to its wider objectives, thus providing a basis for investment and disposal decisions and for setting priorities between them
- The asset portfolio is reviewed regularly, both on a department wide and an organization wide basis, according to criteria set centrally and used consistently across the authority
- The organization has considered both long term (5-10 years) and shorter term objectives
- It links the use of assets to the use of other resources

Decisions about reviews, additions, disposals, maintenance programmes and collaboration with other partners are taken systematically and implementation is monitored by members

Asset Management Goal

The goal of Asset Management as given in the literature review chapter is to meet a required level of service in the most cost effective way through the creation,

acquisition, operation and maintenance, renewal and disposal of assets to provide for present and future customers/communities. The life-cycle approach is central to Asset Management by taking account of the total cost of an asset throughout its life. A better service, not a better asset, is a key indication of successful Asset Management.

Simply stated, Asset Management fulfils a much needed intermediate role between strategic management and operational management in any organization. In order to achieve the much needed alignment between organizational structure, work process and the enabling environment, the organization's strategic intent must clearly reflect the assets/facilities dimensions in its strategic business plans. In this respect, the literature review highlighted three emerging themes:

- the need to link assets/facilities decisions to corporate strategy;
- the need to proactively manage assets/facilities as a business resource, and
- The need for the development of conceptual models and frameworks for integrating the emerging evaluation tools and management skills as they are applied to the provision, operation and management of assets and associated facilities for the attainment of corporate objectives.

The reviews therefore show that assets are owned and managed throughout their life within a framework of return and risk. All asset owners and users expect appropriate returns (benefits) from their investment including financial returns, and more importantly the matching of their assets with the services they deliver

A comprehensive understanding of assets and their life cycle can allow asset owners and users to influence directly the quality of service delivery, and to optimize the value, use and returns from the assets under their control. The emphasis is on control – an organization does not need to own or physically possess an asset to control it.

7.2.3 Analysis and Appraisal of the Field Study

The field studies were carried out in line with what is discussed in the literature review (*Chapters 2&3*) and the interim strategy model chapter (*Chapter 4*). Discussions in these chapters basically view asset management as the optimum way of managing assets to achieve a desired and sustainable outcome, and Asset Strategy as the vehicle by which a College can match its asset portfolio to its service delivery

requirements. The strategy defines the basic relationship between the service delivery strategy and the capital investment, asset maintenance, asset disposal strategic plans and how these plans interlink.

In order to facilitate later comparison, the field study data analysis generally emulates the structure provided by the existing theory. This is because an objective of this research is to confirm and also extend the existing theory. The Process of analysis was not tightly constrained by that structure but was allowed to develop around it.

It is argued in reviewed literature that there is no ideal template for an asset strategy: it should meet the needs and circumstance of each college. The studies were therefore conducted, in line with the literature and the asset strategy model in *fig 4.4*, which is itself a product of the literature review. The study process took the pattern given in *fig 6.1* which resulted in:

- Identification of College Corporate Goals and Objectives
- Identification of Academic Plans and service delivery requirements
- Establishing the link between the Academic Strategy and Asset Strategy
- Establishing the level of Colleges understanding of its asset/facilities and their competences in Asset Management
- Identification of the College's existing assets and facilities, their condition and performance
- Identification of current and future requirements of assets and facilities and the changes required to implement those requirements
- Identification of the problems of the existing assets and facilities
- Identification of the opportunities for development, rationalization and reconfiguration of assets
- Identification of the options available to the Colleges
- An evaluation resulting in a preferred option
- Identification of staffing needs of the estate department and structured programme for staff capacity-building
- Review and adoption of the asset strategy model

The above was achieved through document analysis, observations, interviews and interactive workshops/conferences. At the end of the workshops, a number of recommendations have been put forward which if implemented will bring about tremendous improvements in the way assets and facilities are managed in the Colleges. It should be emphasized that the study is only intended to provide useful overview and framework that will facilitate effective and efficient management of assets and facilities by the College.

7.2.4 A Synthesis of the Existing Theory and the Field Study Data

This section brings together the activities and events identified in both the theory and the field study to enable them to be compared and discussed. Through this process the robustness of the existing theory will be established and consequently justification for any extension to it identified.

The literature in *Chapters 2-4* indicates that asset management provides the strategic link between strategic business planning and operational asset management. In the context of the Colleges, the focus of Asset Management as expressed in their strategic asset objectives is basically to reconcile the demand for, and supply of, physical asset base and associate support services essential for the delivery of its core business. Simply expressed, the principal role of Asset Management is to support the core business of the Colleges, which is teaching and learning.

7.2.4.1 The Asset Strategy Model

An Interim Asset Strategy Model earlier developed and given in *figure 4.4* provided necessary guide in the conduct of the field studies. Asset Strategy, as defined in the reviewed literature, is the planned alignment of physical assets with service demand. It is achieved by the systematic management of all decision-making processes taken throughout the life of the physical asset DPW (2004).

Business objective

Analysis of the field study reveals the strategic business objectives of the colleges and their asset objectives which are observed to be common to all colleges and are properly documented and understood. These constitute the first requirements for the development of an asset strategy, as discussed in *chapters 2-4*. The literature argues that effective asset management requires an understanding of the Colleges' business and the demands of its operations. The Asset Strategy policies of each College can therefore only follow the strategic plans of that College as a whole.

Literature has indicated that in order to achieve the much needed alignment between organizational structure, work process and the enabling environment, the organization's strategic intent must clearly reflect the assets/facilities dimensions in

its strategic business plans. These objectives are provided in the decree establishing the Colleges, NCCE guidelines, College Academic Plans as well as stakeholder needs/expectations obtained through interviews and workshops.

Service delivery requirement

According to the literature, an organization's service delivery strategy defines what services it will deliver in accordance with their corporate plans thus satisfying its stakeholders. It translates the broad goals and objectives into specific service requirements that it plans to deliver outlining the strategy that is to be adopted.

Accordingly, service delivery information contained the College's corporate plan provided necessary details about which services are to be delivered and to what minimum standards. Though the plan obtained in the Colleges did not provide sufficient details, the following generic questions were answered to ensure that asset strategy is developed in response to more specific asset needs:

- What services does the college plan to deliver?
- To whom are the services to be delivered and what are the stakeholders' expectations?
- When are the services required to be delivered?
- Where are the services to be delivered; and
- To what level/standard are services to be delivered?

Answers to these and similar other questions had provided the necessary information required in identifying asset requirements of the colleges vis-à-vis the existing assets and their functionality.

Existing and required assets

The *IAM manual* identified attributes of good asset management which can be broken down essentially into two major groupings:

- Knowledge of the asset base at a strategic and tactical level
- Organizational Capabilities in asset management at a strategic and tactical level.

The Colleges therefore need to have a good understanding of their asset portfolio to be able to manage them effectively and efficiently. According to the literature, the asset portfolio developed by an organization should represent the asset response to its

service requirements. It is derived from analyzing the service delivery requirements and other organization's corporate planning documents. The process of developing an asset portfolio should be undertaken in the context of overall resource management and service delivery.

TAM policy discussed in *Chapter two* identifies five fundamental service delivery characteristics of an asset portfolio. Matching asset performance to service delivery objectives requires an analysis of these five indicators. These service delivery characteristics are (NSWT 2004);

- Asset/Service Dependency (which asks: can asset delivery be made less dependent on asset?);
- Asset Utilization (which asks: are assets fully used in service delivery?);
- Asset Location (this is concerned with addressing this question: Are assets appropriately located for effective service delivery?);
- Asset Capacity (Have the assets sufficient capacity to provide required services?);
- Asset Functionality (are assets suitable for optimal delivery of the services they are intended to support?).

These five characteristics form the basis of the framework for development of an Asset Strategy. The policy further suggests that if asset segments do not comply with any of the above indicators, there is then the need to examine if services could be more efficiently provided by adjustment to the asset portfolio, or by changing the way in which services are delivered to make better use of the available assets.

In line with the above therefore, and to get real understanding of the context in which assets operates, the field studies established a number of background facts in respect of the college assets and facilities. These include: the scope of the asset functions; the number of physical assets; location of assets; tenure of assets; age mix of assets; condition of assets; dimensions of buildings and provision of FM services. Data collection on the assets and facilities were detailed and all encompassing. The data, as stated in the literature review, is needed to build an overall picture with which to inform the strategic planning process. Identifying and gathering relevant data on

existing assets and facilities was undertaken with a view to identifying problems and opportunities which allowed the subsequent generation of options and solutions.

Sound information about the existing assets and facilities in the Colleges is a prerequisite for a robust and appropriate asset strategy, in order to ensure that the information available to the Colleges is sufficiently comprehensive to undertake a complete evaluation of options. Comprehensive, but simple views of the condition of all College assets and facilities, comprising of academic and administrative buildings, student and staff residences and sport fields have therefore been documented. A sample asset/facilities data for one of the Colleges is given in appendix H.

A gap analysis was then undertaken to identify the necessary adjustments to be made to the asset portfolio and related facilities. Successful analysis, according to the literature, is ensured by:

- Having available, all relevant information on existing assets
- Knowing the trends in demand
- Having a clear strategic direction and objectives
- Applying appropriate planning tools and methodologies.

Problems, opportunities and proposals

After identifying the gaps between asset and facilities needed to effectively meet the service delivery requirements of the Colleges (current and future) and the existing assets, factors responsible for such gaps were carefully identified and analyzed, as provided in the literature. This is with a view to providing workable solutions.

The study, through the data collection methods discussed in the preceding chapters and verification/validation workshops/conferences therefore, had identified most of the existing problems, opportunities and proposed solutions. Accordingly the interim asset strategy model was adopted with some minor modifications that were aimed at properly contextualizing it. This is discussed in the next section.

7.2.5 The Modified Asset Strategy Model

The interim asset strategy model (*Figure 4.4*) was developed based on literature review and using insights from the researcher's background. It was then used to guide the conduct of the field studies and was at various interactive workshops, presented to stakeholders for necessary modification and adoption. Details of the field studies including workshops and conferences are given in *Chapter six*.

Basically, stakeholders were generally satisfied with the interim model as a veritable tool for effecting improvements in the management of College assets and facilities. To make the model more robust and adoptable by the Colleges however, the analyzed data from the field studies and the observations raised by the stakeholders during verifications workshops were taken into consideration which resulted into some minor modifications of the interim asset strategy.

The field study data and workshops had identified a number of factors that needed to be included in the model, principal of which are:

- Assessment and decision tools of demand management, risk management, value management and Asset information.
- Space utilization and management

These factors were then appropriately inserted into the new asset strategy model given in *Figure 7.1*, and reasons for the insertion as identified in the workshops are discussed in the next section:

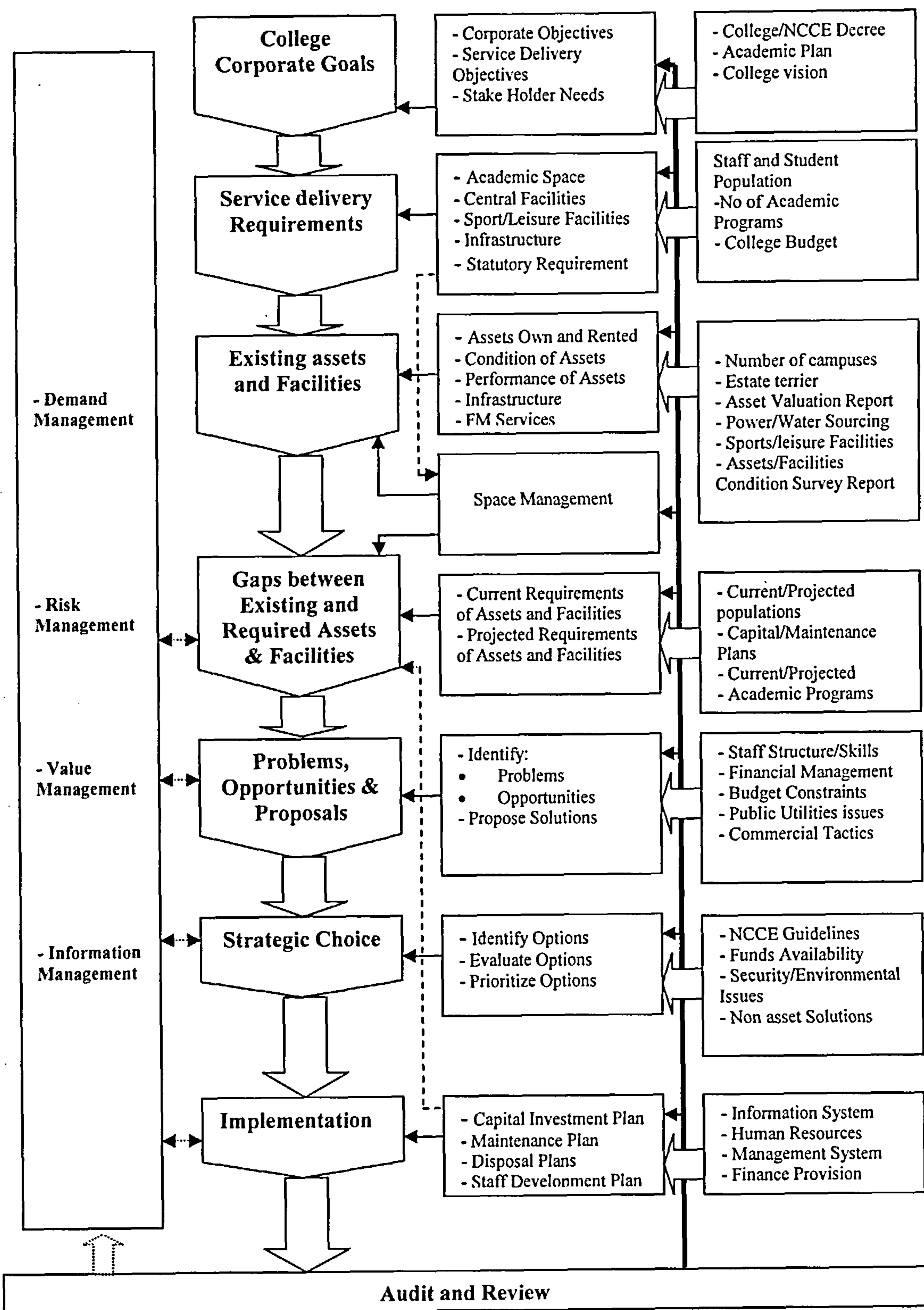


Figure 7.1 Modified Interim Asset Strategy Model the Author: 2008

7.2.5.1 Justification for the review of model

The Interim Asset Strategy Model earlier developed was presented to stakeholders for the purpose sensitizing them on the need to develop their asset strategies and to also get them to participate in the development of the model which will subsequently guide them in developing their own strategies. They were therefore encouraged to properly understand, and critically examine the interim model and then make necessary additions or deletions in order to strengthen it. The justifications for the main additions are therefore discussed below:

Asset management decision Tools

Service delivery by the Colleges will consume resources. It will therefore at least partly rely on how efficiently limited resources are managed and coordinated. Service delivery will be optimized at all levels when resource planning and various asset management tools are integrated, which includes Demand Management; Risk Management; Value Management; space Management and Asset Information.. In developing Asset Strategies, Colleges are required to critically assess their operating environment and their competency to respond to that environment. Those assigned the task of developing asset strategies need to make difficult decisions that have long-term and often critical consequences for their Colleges. These decision tools are therefore required to provide the necessary assistance.

Demand Management – As discussed in chapter two, demand motivates the supply of services and leads to the provision and use of resources including physical assets, and demand management aligns demand for services with the available resources to ensure genuine needs are met and College benefit is maximized.

It was observed that the Colleges cannot possibly meet up with the stakeholder demand for assets and facilities. Even if they can, and the colleges keep building assets without some constraint on demand it is likely that their capital requirements to operate and maintain these assets will eventually jeopardize the services they are seeking to provide.

Demand Management should therefore be a key element of the Asset Strategy Model, which should essentially identify demand as the needs of services, rather than wants of assets. Decisions as to which needs are satisfied should then be made from a whole of college perspective. It is expected to manage demand in a variety of ways, such as:

- by reducing the underlying need for the service, e.g. curtailing student population
- by changing the way in which stakeholder needs will be met to reduce pressure on available resources. These needs, expectations, hopes and aspirations are the driving force for the supply of services.
- by raising awareness of the connection between stakeholder needs and expectations and the subsequent delivery of services and expenditure on physical assets
- suggesting ways that colleges can respond to the needs and expectations in a manner that best matches service delivery (and the relevant supporting assets) to the available resources

Risk Management – Risk is defined in the literature review (*Chapter two*) as the chance of something happening that will have an impact, either positive or negative, on objectives and/or outcomes. It arises because of limited knowledge, experience or information and uncertainty about the future or through changes in the relationships between parties involved in an undertaking. This latter category is particularly relevant to situation in the colleges where provision, operation and maintenance of assets and facilities are contracted out and private sector participation initiatives are being undertaken, in addition to the active Government involvement in the policy formulation and funding of the colleges. Other potential asset-related risks in the Colleges are numerous and may include:

- Inadequate maintenance;
- Capability;
- Inadequate Electricity and water supplies
- Industrial action;
- Stakeholder expectations;
- Technological change;
- Demand trends;

- Population growth; and
- Environmental events.
- Government policies
- Funding constrains

It is therefore recommended that risk management should be another key element in the model, as it is the process of identifying, analyzing and addressing risks and opportunities on an ongoing basis – not only to avoid negative outcomes, but also to exploit emerging opportunities. Inclusion Risk Management in the model is aimed at providing the Colleges with a structured way of identifying and analyzing potential risks, and devising and implementing responses appropriate to their impact.

Value Management – Value Management is another powerful management tool which should be integrated with demand management and risk management to provide a strong foundation for effective decision making process for the colleges.

As discussed in *Chapter two, Male, Kelly, et al (1998)* define Value Management (VM) as proactive, creative, problem-solving or problem-seeking service which maximizes the functional value of a project by managing its development from concept to use. The process uses structured, team-oriented exercises that make explicit and appraise existing or generated solution to a problem by reference to the value requirement of the client.

As part of the asset strategy implementation process, the model provides for the development of asset management strategies involving three interlinked planning processes, namely:

- Capital Investment Strategic Planning
- Asset Maintenance Planning
- Asset Disposal Planning

Each of these plans and their resulting programs projects must be based on sound principles of analysis and planning. Value Management is an appropriate tool that can be used to develop and implement these plans, hence the imperatives of its inclusion in the Asset Strategy Model.

Asset Information – It was observed that asset information is also another important factor in the development of an asset strategy, and should form part of the model. This is informed by the fact that colleges can not effectively and efficiently manage their physical assets without knowing what they have, where each asset is, what its condition is, and what is the demand for it. The effective management of an asset portfolio is dependent on the availability of relevant, reliable and timely information. The objective of an Asset Information therefore is to provide data in a form which allows the Asset Manager to access summary data which will enhance the strategic planning processes.

It is therefore quite obvious that effective implementation of asset strategies requires the use of asset registers to provide the stated invaluable source of information of the College assets. The registers are listings of information relating to various aspects of college asset portfolio, in a form that allows data to be cross-referenced and retrieved as required, and should record all assets on the balance sheet, together with basic information as to use, size, value, occupying department etc.

Space Management

Space management is an important aspect of estate/facilities management of any college and therefore needs to be incorporated into the asset strategy. Poor space utilization had been observed in all the colleges studied. The Colleges will therefore need to assess space utilization and space need in order to objectively consider their accommodation requirements as part of the asset strategy. This will highlight the extent to which the accommodation is being efficiently utilized and opportunities for rationalization and remodeling and more effective timetabling. Reducing estates costs by using space more efficiently can release funds for other important activities.

The Colleges are continuing to expand at a time of funding constraints, and so the need to eradicate waste and inefficiency in the use of space is particularly important. New teaching and learning practices and developments in research are changing the space needs of the Colleges. Information technology, part time students are major influences. In addition, student numbers are apparently on the increase. All these

factors have combined to make it imperative recognize space management in the asset strategy and this has been duly inserted in the model as shown in Figure 7.1.

The next section discusses the conduct of the research validation exercise, the modified asset strategy model and the responsibilities for the development of asset strategy by the Colleges.

7.3 Research Validation and Final Evaluation of Model

This research has developed an asset strategy model by first developing an interim model, based on literature review, which was then modified during the field study exercise and finally validated. The purpose of this section therefore is to discuss what validation is and how the validation exercise was conducted. Also discussed is the modification of the asset strategy model, the various phases of the model and the responsibility for its development by individual colleges wishing to adopt it.

7.3.1 Research Validation Exercise

Validity has been defined as: "the assessment of whether one's findings or conclusions are faithful or true to what one is studying" (Braud, 1998). It therefore deals with the appropriateness of the method to the research question. Proponents of qualitative methodologies have developed techniques that safe guard against the possibility of error in, excessive subjectivism, and delusion whilst ensuring trustworthiness, including credibility, transferability, dependability, and confirmability (Lincoln 1985). These techniques include prolonged engagement, persistent observation, triangulation (of sources, methods, and investigators), peer debriefing, negative case analysis, referential adequacy, member checks, thick description, dependability and confirmability audits, and the reflexive journal. One particular aspect of validation has specific implications for model building research, namely outcome validity (Darlington 2002).

In respect of this research, the design for data gathering and data analysis was from the onset set out to be transparent and to ensure as far as possible that the data gathered reflects the contexts studied. The approach to data gathering and analysis thus

incorporates rigorous cross checking and methodological triangulation to eliminate bias and establish reliability and validity. There was a feedback system as well, through structured interactive workshops.

The triangulation strategy of verification is a method in which the researcher collected data through a combination of interviews, observation and document analysis. For example, what someone said in an interview was checked against what the researcher observed in a field visit and what he saw or read in documents relevant to the study. This facilitated some kind of pooled judgment which strengthened reliability and validity.

Feed back method involved asking the participants to comment on the researcher's interpretation of the data. That is, the tentative findings were taken back to some of the participants to confirm if researcher's interpretation of data is correct. Interactive workshop was then organized at the end of study of each College, involving research participants and other stakeholders who were not involved in the field studies.

It can be argued that the adopted methodology described in *Chapter five* has a number of in built techniques which contribute to the validity of the outcome, such as the interactive feedback workshops. Additionally, most of those interviewed throughout the study were from the senior management of the Colleges, which should guarantee the quality of that data. At the end of the whole field studies however, a validation exercise was undertaken in order to place specific focus of the validity of proposed model as the outcome of the research study. At the validation conference, NCCE was represented by an expert on Asset Management. An academic and expert in Asset Management in the Department of Civil Engineering of a University located in same city as the College that hosted the conference also attended. The active participation of all attendees of the conference, and particularly the two experts has further strengthened the validity of the model.

A common claim made by sociologists is that an analysis can be validated by the very members interviewed in the sample described (Silverman 1985). Focus groups are used, where the findings and conclusions are discussed and reviewed by practitioners. This is done by seeking consensus on the investigator's description, and the perception

of the members of the collectivity that is being investigated (Silverman 1985). This method was adopted in this study by presenting the findings and the modified asset strategy model final framework to a validation conference held on the 13th July 2007, in the conference hall of one of the case study Colleges. Participation was drawn from the case study colleges and other colleges not involved in the case studies.

The procedure adopted for choice and administration of the validation conference is presented in Table 7.1.

- **Objective(s):**
 - To validate findings from the field studies
 - To validate the applicability of the proposed Asset Strategy Model in real-life situations.
 - To ensure that the proposed model fulfils the requirements of the colleges for an effective and efficient management of their physical resources, now and in the future.
- **Sampling procedure:** The choice of the colleges and organizations to participate in the validation exercise was based on a purposive sampling approach where case study colleges, three other colleges and Government and private organizations that are believed to have influence on the Colleges were targeted. Choice of participants from within each college/organization was left to the recommendation of their respective management.
- **Administration procedure:** A letter was sent to the heads of the selected colleges, Federal Ministry of Education, National Commission for Colleges of Education (NCCE) and the Department of Civil Engineering of a University that is located in same city as the college that hosted the conference. This was then followed by phone calls to further explain the purpose of the exercise. The session involved a 30 minute presentation by the researcher of the findings, including report on identified problems and opportunities (appendix K) and proposed model (fig 7.1), this was followed by a two and a half hour discussion, review and critique of the model. Each session was attended by principal officers of the colleges and representatives of the organizations selected for the exercise. NCCE was represented by an asset management consultant whose participation greatly enhanced the quality of the exercise.
- **Presentation of results:** Findings from the validation exercise are discussed below. Additionally, a list of participants is also presented below

Table 7.1 the Validation Exercise Administration Procedure

List of Validation Conference Participants

- Two representatives of each, from the three Colleges that participated in the main study
- Two representative of each, from three other Colleges that did not participate in the study
- A representative of the Federal Ministry of Education
- A representative of the National Commission for Colleges of Education, NCCE
- An academic from the Department of Civil Engineering of a University in the same city as the conference host College

7.3.1.1 Validation Conference - Summary of Discussion

The discussion at the validation conference centred around three main issues:

1. A debate on the general finding of the study and common problems and opportunities identified during the field study in the various Colleges.
2. A consensus on stakeholder needs that are applicable to all Colleges.
3. A general deliberation on the proposed asset strategy model, including whether it is implementable, what it should do and what should constitute the model in order to meet the stakeholder needs and aspirations.

The delegates were divided into three groups. A deliberate plan was made to keep participants from same college/organization in different groups in order to avoid bias in opinions. The groups were then asked to present a summary of their discussion. These summaries were debated in plenary session and consensus reached on how the Asset Strategy Model should be. The following provide a summary of what was discussed:

Issue 1: A debate on the general findings of the study and common problems and opportunities identified in the colleges

The study results in Section 7.2.1 and the common problems and opportunities identified and presented in appendix K were used as the basis for the discussion, where each issue was brainstormed and debated. The terminology was also debated, and a consensus reached. During the course of discussion participants also described the practice in their respective Colleges as well as their knowledge of what is obtained in other organizations that have well developed strategies for managing their physical facilities, and suggested what should be reflected in the proposed model. The groups were asked to examine the common problems and opportunities identified during the field studies, and discuss the following:

- How well the study results reflect the situation in the Colleges
- How well the presented table (appendix K) reflects the current problems within their colleges and also reflects their needs as stakeholders.
- How feasible are the identified opportunities
- The terminology used to describe the problems.
- Any other issue that could impact on the model.

Summary of the report on issue 1 is as follows:

- The study results have generally reflected the actual situation in the colleges
- The table presented has largely reflected the problems and opportunities in the colleges and needs of stakeholders.
- The opportunities are largely feasible, particularly if the Colleges are more prudent and transparent in the management of their finances.
- The terminologies used are clear and conforms with what is generally used in the Colleges

Issue 2: A consensus on stakeholder needs that are applicable to all colleges

Stakeholder needs presented was based on the asset objectives of the Colleges discussed in chapter seven, which are common to all the Colleges. The list of the stakeholder needs was therefore adopted after exhaustive deliberations.

Issue 3: A deliberation on the proposed asset strategy model

Three catalyst questions were proposed to begin the discussion:

1. Do you think the colleges can be able to develop and implement an asset strategy based on the proposed model?
2. What do you want the asset strategy model to do?
3. What do you want the asset strategy model to include?

The following answers were generated:

1. A consensus that the Colleges can indeed develop and implement Asset Strategy based on the proposed model
2. Participants expect the proposed model to:
 - provide a strategy that would ensure optimum utilization of College assets and facilities.
 - provide for proper identification of service delivery requirements
 - provide for proper documentation of existing and required assets and facilities
 - Provide for demand management and risk management
 - Provide for space management
 - provide for identification of problems and solutions.
 - provide for human resources development.
 - Pool ideas to instill "good practice" into the current practice in the colleges
 - Provide for asset performance measures

- be simple and user-friendly

At the end of the exercise, the asset strategy model was strengthened and confirmed in line with the needs and expectations of the stakeholders. A modified and confirmed Asset Strategy Model is given in *Figure 7.2* and discussion on the evaluation of the model is given in the next section.

7.3.1.2 Evaluation of the Asset Strategy Model

One of the principal objectives of this research is the development of management strategies that will enhance effectiveness and efficiency of assets and facilities in meeting service delivery requirements of the Colleges. Literature has shown that this can be achieved through the development of asset strategies. The strategy is based on an analysis of the assets and facilities, the Academic Plan, current resources and future opportunities. It will enable the Colleges to:

- Develop the assets and facilities to achieve College Goals
- Effectively and efficiently manage physical resources
- Demonstrate that provision, maintenance and development of the assets and related services are consistent with the College's Strategic Plan, and to secure value for money.

Asset Strategy is a top-level plan that will outline and guide the College's asset response to its service requirements, through the development of an asset portfolio, and identifies any needs or 'gaps' to support services and addresses those through planned capital investment, disposal or maintenance including replacement and/or upgrading.

Accordingly, this research, through interrogation of the literature, developed an Interim Asset Strategy model as shown in *Figure 4.6*. The model then guided the conduct of field studies and stakeholders were provided with the opportunity to study and participate in the review of the model to make it more robust and adoptable by the colleges. Involving staff, students and other stakeholders in the process of developing the model is very important for the success of its adaptation and subsequent implementation. Thus a participatory approach was used in appraising the model,

identifying the strategic needs, and working out the process of strengthening it for the benefit of all the Colleges.

The interim model was reviewed and slightly modified (*Figure 7.1*) in the course of the field studies. The modification was achieved after the interim model was subjected to critical analysis by the stakeholders during interactive workshops, in order to align it with their needs and aspirations. A final modification of the asset strategy model was carried out at the end of the validation conference as discussed in the next section.

7.3.1.3 Final Review of the Asset Strategy Model

The validation conference deliberated exhaustively on what the asset strategy model should do and include. The stakeholders' needs and aspirations were observed to have been largely addressed by the model. Accordingly the asset strategy model was adopted, albeit with some minor amendments, as being implementable and capable of ensuring effectiveness and efficiency in the management of assets and facilities in the colleges. The amendments that needed to be effected, as observed during the verification conference is the inclusion of:

- Asset Performance Measures and
- Staff development Plan.

Accordingly, these observations have been duly incorporated and a final asset strategy model produced as in *Figure 7.2*.

Justification for the amendments

The aspects identified in the validation conference for inclusion in the model are considered very vital to its successful implementation. The justification for such additions is given below:

Asset performance measures

The inclusion of asset performance measures in the model is considered essential to the development and implementation of an Asset Strategy as they provide a gauge of

how well the management of assets is supporting services. This should be directly linked to the identification of existing assets and facilities.

The Australian asset strategy models observe that there are two groups of asset performance measures that must be identified and applied in the Asset Strategy. They are equally important and focus on two distinct aspects of asset management. (TAM 2000):

Effectiveness measures

- demonstrate how well the asset portfolio supports college services;
- demonstrate the extent to which an asset's performance supports the delivery of services. And

Efficiency Measures

- demonstrate how 'well' assets are managed; and
- what is the cost to operate assets.

Effectiveness performance measures provide the most objective method of determining how successfully assets have been used in supporting services. It helps to identify asset-related risks and establish service focused priorities. Efficiency measures show how the cost of assets affects the cost of services. Demonstrate whether value-for-money service delivery is being achieved. They may also show whether the assets are being managed within the budgetary and industry standards for similar assets. The inclusion of a comprehensive set of qualitative and quantitative measures will therefore demonstrate the College's knowledge of its asset portfolio and that it understands its greater role in maximizing the use of available resources.

Staff Development Plan

The conference participants had identified lack of structured staff development programs for College estate staff as one of the problems militating against effective management of College assets and facilities. In order for the Colleges to fulfill their asset objectives effectively and efficiently, it is important that estate department staff be provided with the necessary support and training opportunities to enable them to undertake their roles to the highest standard.

It is therefore important for each College to have staff development program that is flexible and adaptable to the changing environment. New programs and initiatives need to be considered and implemented on a continuous basis. This staff development program should be embedded into the asset strategy model, for it to achieve its stated objectives. It is added as a major input to the implementation phase of the model, along with capital investment, maintenance and disposal plans.

7.3.1.4 Evaluation of the Asset Strategy Model

The asset strategy model has been developed and reviewed to ensure that Colleges adopting it are able to effectively align their asset planning and management with service delivery priorities and strategies, so that all assets support services in the most appropriate, effective and efficient way.

The model which was first developed prior to commencement of the field studies was subjected to critical analysis, resulting to some modifications during interactive workshops organised in each Case Study College to review field study data. It was further reviewed during the Validation Conference which took a holistic view of the model, resulting to the final production of an Asset Strategy Model as given in Figure 7.2. It is expected to bring about tremendous improvements in the management of College assets and facilities.

The Asset Strategy Model is expected to outline and guide a College's asset response to its service requirements, through the development of an appropriate asset portfolio. It will identify any needs or 'gaps' to support services and addresses those through planned capital investment, disposal or maintenance, including replacement and/or upgrading. Each College adopting the model will be able to develop its own Asset Strategy that will:

- establish the asset portfolio that most appropriately, effectively and efficiently meets their service delivery requirements within available resource limits;
- demonstrate how the College's asset portfolio supports its service delivery;
- set priorities for the assets to be managed;
- develop gap analysis between the existing and required assets/facilities;
- identify asset-related risks which affect delivery of services;

- identify asset performance levels required to achieve service performance
- provide basis for more detailed strategic plans on Capital Investment, Asset Maintenance, Asset Disposal

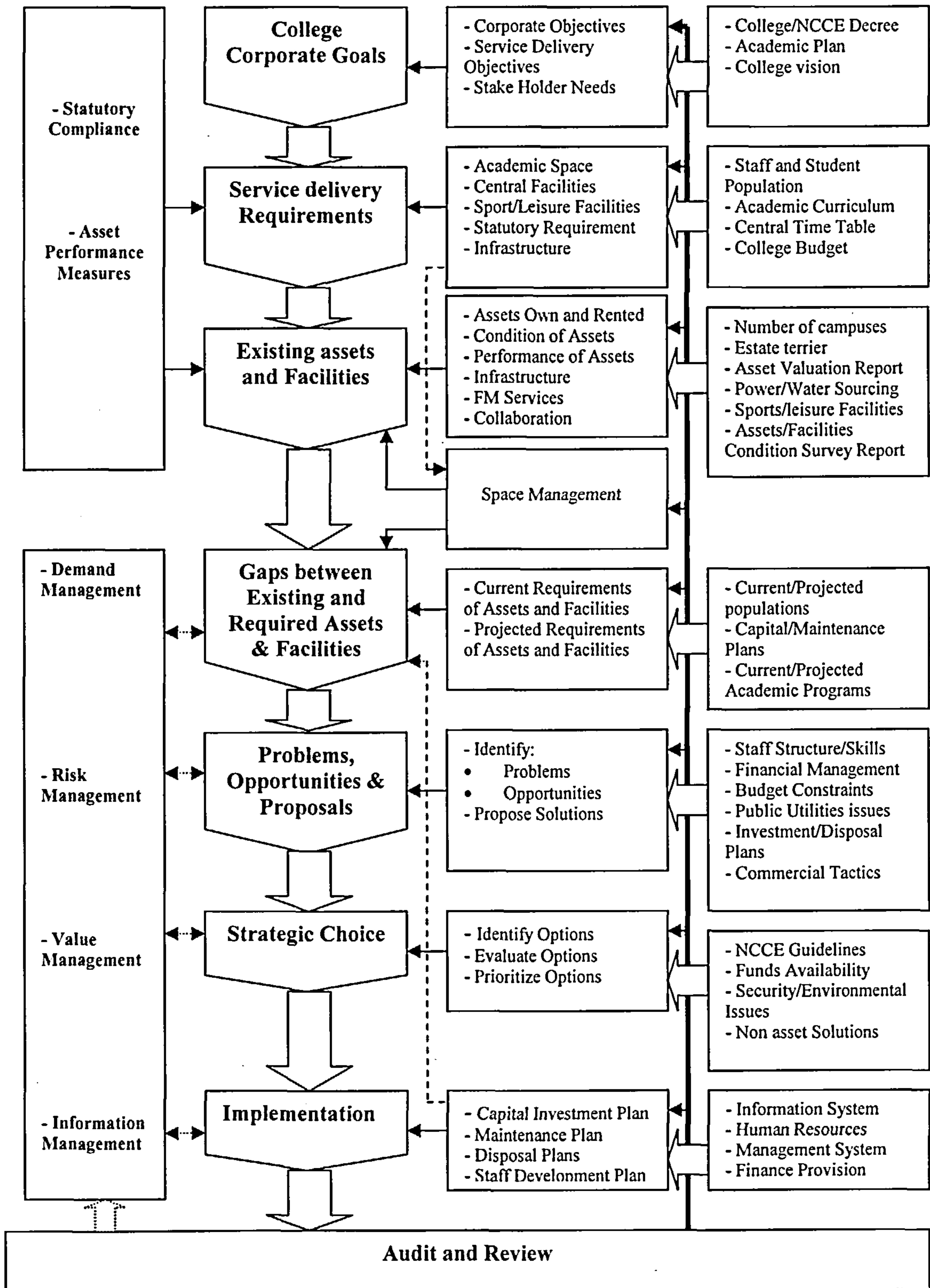


Figure 7.2 The Asset Strategy Model The Author: 2007

The Asset Strategy as in the above model should therefore translate into one document which describes:

- The link between the Academic Strategy and Asset Strategy
- The College's existing assets and facilities, their condition and performance
- The current and future requirements of assets and facilities and the changes required to implement those requirements
- The problems of the existing assets and facilities
- The opportunities for development, rationalization and reconfiguration of assets
- The options available to the College
- An evaluation resulting in a preferred option
- A new staffing needs of the estate department and structured programme for staff capacity-building
- Implementation of the Asset Strategy, including the financing and how this strategic document can be converted into annual plans which enable delivery.
- Audit and review of implementation to ensure effective development and implementation of the strategy.

7.3.1.5 The Key Components and Processes of Developing the Asset Strategy Model

The Asset Strategy Model has been made as simple and user-friendly as possible to ensure its easy adoptability by the colleges. It is basically made up of some key components as depicted in Figure 9.1. Most of these components have been discussed in *Chapter four*. A brief explanation of the functions of the key components of the model is however given below, which also provides the necessary guidance to the Colleges on the processes involved in developing an Asset Strategy.

College Corporate Goals

The Asset Strategy is essentially expected to be the College's plan for considering where it is now in respect of its assets and facilities and, within the context of its overall strategy, where it wishes to be in the longer term. The strategy should outline the key asset objectives and consider options the college may take in order to reach the desired future position. The corporate objectives of the College are therefore very important to the development of an asset strategy and should be the first to be identified and analyzed.

The strategy must be part of and flow from the College Development Plan and consist of a separate document consistent with, and designed to further the Strategic Objectives of the College. The Asset Objectives should therefore emerge from the strategic objectives expressed in the College Development Plan. In this phase, relevant points in the college corporate objective (e.g. Production of qualified teachers) that informs the need for assets and facilities should be highlighted. This will be aided by projections in respect of student enrolment, staffing and academic programmes, etc.

Service Delivery Requirements

In this component, the services that needs be delivered, in accordance with the College corporate objectives should be clearly identified and documented. In identifying these services, College finance and academic plans should be taken into consideration. College requirements in respect of academic space, central facilities, sports/leisure facilities, residential accommodation, infrastructure facilities, power and water supply needs, etc, should all be clearly stated.

Service delivery information contained in the College Corporate Plan and Asset Objective provides necessary service details about which services are to be delivered and how, to develop an Asset Strategy that best meets the college's needs. In addition to the information presented in the college asset objectives, the following questions should be answered to ensure that the Asset Strategy is developed in response to more specific service needs:

- What services does the college plan to deliver?
- To whom are the services to be delivered and what are the stakeholders' expectations?
- When are the services required to be delivered?
- Where are the services to be delivered; and
- To what level/standard are services to be delivered?

Performance measures should also be incorporated in this phase. The primary focus of Strategic Asset Management is to achieve optimal service delivery through effective asset solutions and efficient asset management. Traditional performance has been measured in terms of inputs and the minimization of waste at the input end of the

resource equation. Strategic Asset Management requires asset managers to focus on outcomes and the output end of the resource equation. The real measure of success is enhanced service delivery. Performance measures and benchmarks in Strategic Asset Management plans should therefore be primarily directed at measuring these outcomes.

Existing Assets and Facilities

Sound information about the College assets and facilities is a prerequisite for a robust and appropriate asset strategy, in order to ensure that the information available to colleges is sufficiently comprehensive to undertake a complete evaluation of options. This component of the strategy model is therefore expected to give a comprehensive but simple view of the existing assets and facilities, including number of buildings & sizes, their condition, age, fitness for purpose, space utilization, value, usage, ownership, provision of FM services, etc.

Data on the existing assets and facilities are needed in this phase, not only to facilitate operational decisions, but also to build an overall picture with which to inform the strategic planning process. Identifying and gathering relevant data on the existing assets and facilities and across a range of performance indicators should be undertaken with a view to identifying problems and opportunities which will allow the subsequent generation of options and solutions.

Information on the assets needs to be stored within an appropriate data system. The system, whether manual or computerized or a combination of both, should be sufficiently flexible to provide for storage, updating, retrieval and interrogation of data. However, because of the complexity of the asset information involved, it is recommended that a computerized data system is considered. This has a number of advantages over a manual system including the ease of storage, the ability to retrieve large amounts of data as required, the facility to cross-reference, and the ability to interact with other databases.

Gaps between Existing and Required Assets and facilities

In this phase, an analysis will be made of the existing assets and facilities, vis-à-vis current and future service delivery requirements, to identify any gaps. This will

provide a schedule of problems to be solved and the opportunities opened to the college to solve them. It will also focus on the future assets and facilities needs of the college to satisfy its corporate objectives and provide a prioritized long term 'wish' list with emphasis on aspects that are achievable in the short term, taking into consideration the financial resources available to the College.

Having identified the current assets held and what assets are likely to be required in the future, a 'gap analysis' should be undertaken to identify the necessary adjustments to be made to the asset base. Successful analysis is ensured by:

- having available all relevant information on existing assets
- knowing the trends in demand
- having a clear strategic direction and objectives
- Applying appropriate planning tools and methodologies

To achieve these, asset management tools of demand, risk, value management as well as asset information, should be effectively employed to identify:

- existing assets that are required and are suitable to meet the service delivery requirements;
- existing assets that are required but are in need of refurbishment to meet the service delivery requirements;
- assets that are surplus to long term needs and can be disposed of or mothballed for future use;
- assets that are not currently required and should be mothballed for future use;
- assets that must be acquired to meet the service delivery requirements.

Problems, Opportunities and Proposals

Under this phase of the model, problems and opportunities of the college will be examined and proposals suggested to maximize the potentials of the assets and facilities. It is expected to be presented in a tabular form, indicating the links between the problems, the opportunities and the subsequent proposal for each asset and facility.

All problems, both existing and those which may hinder future progress, should be identified and brought together in the asset strategy. There may be many feasible ways to solve some of the identified problems. For example, new build is only one option for dealing with insufficient accommodation: remodeling existing space, adapting surplus accommodation or the acquisition of an existing building, extending

operational hours, leasing or the use of outreach centers are other options which should be considered.

Strategic Choice

In many cases, there will be several strategic alternatives that have asset implications. This phase of the model involves identifying, evaluating and selecting these alternatives:

Identification – Identification involves establishing the potential ways to address considerations or outcomes identified during the ‘gap analysis. These may include:

- addressing demand (i.e. developing strategies to influence the demand for asset usage)
- addressing supply (i.e. developing strategies to ensure that assets perform more effectively and efficiently, for example, in respect to functionality, and/or maximum utilization)
- providing a non-asset solution, expanding capital to improve the existing asset or to provide a new asset solution

Evaluation – The evaluation of strategic alternatives requires an assessment of the compatibility of alternatives, giving consideration to issues such as:

- the external factors (e.g. political imperatives, NCCE or Federal Ministry of Education demands, etc)
- the internal factors (e.g. budget imperatives, service delivery imperatives)
- measurability (e.g. Can it work? Are there performance measures that can measure it?)
- risk exposure

Selection – Strategic alternatives significance to stakeholders and their ability to be implemented, before the preferred need to be arranged in priority order, based on their strategies can be selected. Categories into which the strategic options are grouped are:

- new assets to be procured
- existing assets to be upgraded
- assets that are performing in accordance with predetermined criteria
- assets that are surplus to requirements

Option appraisal is a key part of developing the asset strategy as it pulls together all of the considerations outlined in the previous sections of this model. The Asset Strategy should include an appraisal of the high level strategic options open to the College to meet its asset objectives. Normally this would include:

- a ‘do-nothing’ or ‘do minimum’ option to set the base position against which other options may be judged;
- a ‘ceiling’ option to examine, for example, moving the entire College to another site
- mid-range options which may include, for example, consolidation to one or more sites, where the College is split across a number of sites or some form of reconfiguration or remodelling of the some buildings.

The ‘do nothing’ (or status quo/do minimum option) and ‘ceiling’ options will provide the parameters for comparing the costs and benefits of all other options. However, it is acknowledged that there may be some circumstances where an examination of the latter option is artificial and inappropriate and colleges should set their own ‘ceiling’ options for comparative purposes. It is essential, however, that Colleges demonstrate that a full range of realistic asset options have been identified, thoroughly appraised, costed and evaluated.

The following steps should be undertaken when conducting an appraisal:

- specify SMART (Specific, Measurable, Achievable, Relevant and Timed) objectives;
- identify all possible options;
- identify, quantify and where possible value the costs, benefits, risks and uncertainties associated with each option;
- analyze the information;
- conduct a sensitivity analysis which involves examining the impact of changes in the underlying assumptions of the preferred option;
- present the results and make recommendations.

This important phase of the model is intended to demonstrate that options chosen are realistic, having considered a range of options. Preferred options may be constrained by some factors, including finance, security and environmental issues, NCCE requirements, etc. The overall strategy must be achievable, not an ambition which depends on unrealistic assumptions.

Implementation

The strategy model contains an implementation component which should provide implementation plan for the preferred options. It will include realistic assessment of the levels of funding available to finance the preferred options. There will be a series of operational plans that includes capital investment plan, maintenance plan and asset disposal plan. Staff development issues are also important factors which should be part of this phase of the model. In order to ensure effective and efficient strategy implementation, an appropriate management structure should to be in place to address issues such as:

- adequate staffing levels
- appropriately skilled personnel
- information technology systems
- accurate asset registration systems
- appropriate organisational systems
- financing provisions

The implementation plan should be accepted by the College Governing Council, which is in any case, required to approve the asset strategy document. The implementation plan will contain a number of different projects or proposals to meet the determined strategy. Senior managers in the college should take responsibility for implementing the plan. It may be beneficial for the Governing Council to establish a standing committee or working group to oversee the implementation of the College asset strategy.

The final strategy should be widely understood and accepted within the College and mechanisms should be put in place to monitor and review progress with implementation.

Appendices

Some relevant documents will be annexed to the strategy, or may exist as supporting documents to aid effective implementation. These include;

- College corporate goals, mission statement and academic plan
- Current and projected student and staff population
- Government policy on asset procurement, maintenance and disposal
- Statutory requirements
- Capital investment plan
- Maintenance plan

- Asset disposal plan
- Budget plans
- Asset register
- Building use and floor space schedules
- Valuation, leases and insurance information
- Major works programme
- Environmental policies, transport and parking policies
- Staff recruitment and training plans
- Any other relevant document

Audit and Review

The strategy needs to be reviewed and evaluated. This phase will therefore provide for means of questioning each phase of the strategy to ensure that all important factors are taken into consideration, so that the College can have assets and facilities that meet its service delivery requirements effectively and efficiently. Particular emphasis should be given to physical, financial and operational planning issues. The objectives of the asset audit and review process are to:

- match the quantified service delivery requirements with the quantified capabilities of existing assets
- maximize return on the asset portfolio
- develop disposal strategies to cater for surplus assets
- develop investment strategies to overcome asset deficits
- develop maintenance strategies for continuing use requirements

This phase of the model is an ordered process of determining and quantifying the performance of the College's asset portfolio in terms of effective delivery of services and economic optimization of assets.

An initial investment of resources, staff and training, as well as supporting infrastructure, will be needed to set up the asset review and analysis process. A rolling review process thereafter will lead to a gradual improvement in asset utilization as compared with criteria established as part of the asset audit and review process.

To develop the strategy therefore, each college is expected to appoint a dedicated team that will be charged with responsibility carrying out the job as in the model. The next section discusses those that need to be saddled with such responsibility and what needs to be done in order to successfully develop an asset strategy.

7.3.2 Responsibility for the Development of Asset Strategy

Having developed an asset strategy model, the researcher also identified those that should have the responsibility of developing such strategies for their individual colleges. This is aimed providing the necessary guidance for each College to be able to develop its own Asset Strategy. It is important to note that good management cannot be imposed externally, so this project did not seek to prescribe a definitive asset strategy, but to provide a useful overview and framework for developing such strategy by individual Colleges, while the asset strategy model serves as a benchmark.

Developing an asset strategy is an important process and thus requires the active participation of stakeholders. The Director/Head of estate department should be the coordinator and major contributor to the asset strategy, but the involvement of other stakeholders is also essential, in order to ensure that the process and its product are owned by the college as whole. As earlier observed “ownership of an innovation by stakeholders is among the key factors responsible for the success of its implementation” (Stromquist 1996). Figure 7.3 shows a diagram of those who should have responsibilities in the development and implementation of asset strategy in the college.

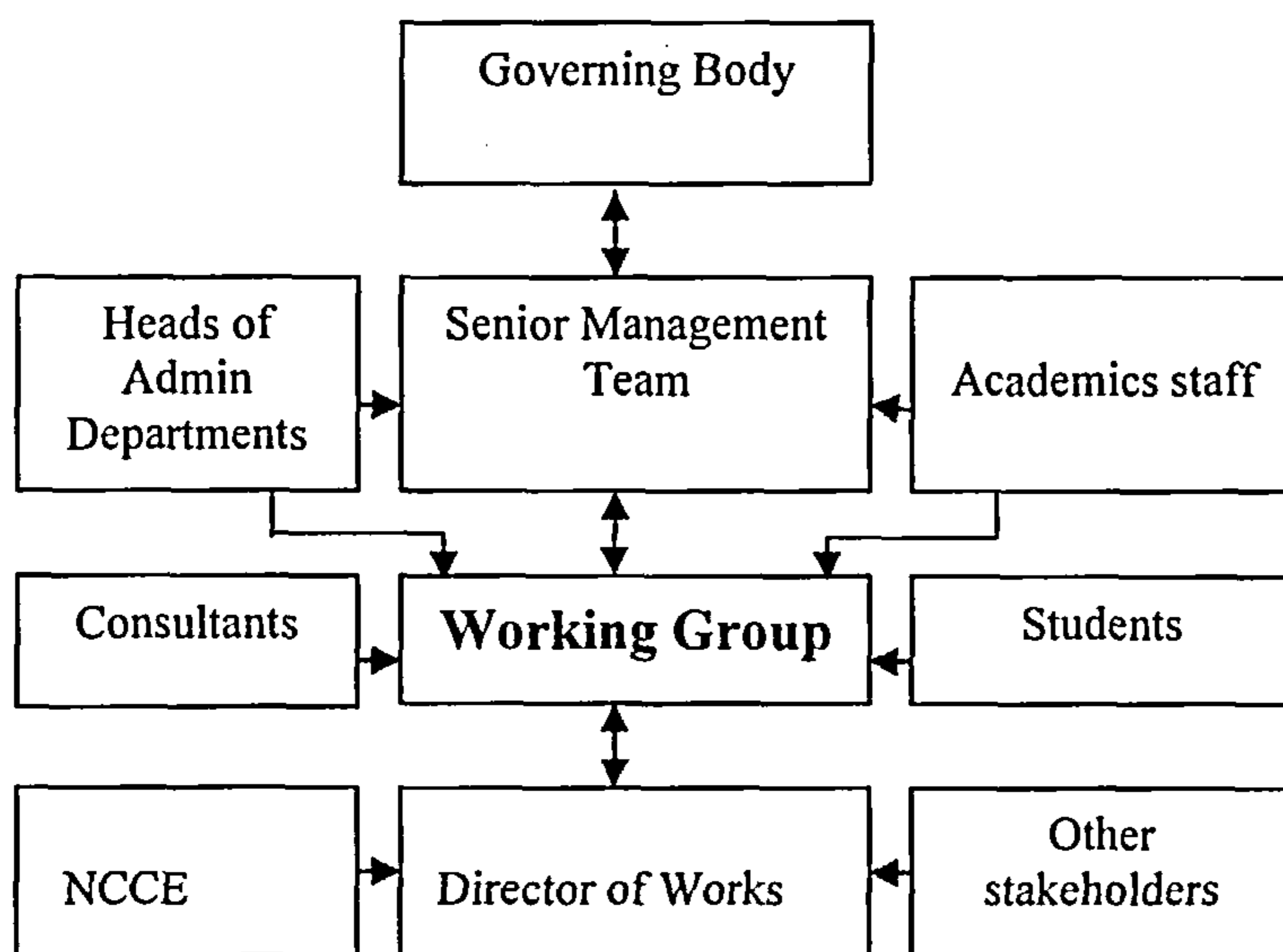


Fig 7.3 Responsibilities for Developing an Asset Strategy the author, 2007

A working group should be constituted which should liaise with all stakeholders and oversee the production of the asset strategy. The composition of the working group

and the use to which it is put lies with the Governing body and the Management of the College. However, the following points will be taken into consideration;

1. The working group can work better when it is small and focused. A large committee type can create delays and stifle creativity.
2. The working group will need to include representatives from the academic community (ideally the Deputy Provost), the Finance department (ideally the Bursar), the Registry department (ideally the Registrar), Works and services (estate) department (the Director of Works) and a consultant. The working group should consider how it would communicate with the governing body.

It is recognized that many colleges may not have the in-house resources required to develop their asset strategies and may have to engage the services of consultants from outside. The key issue is that the college's senior management must ensure that the consultants engaged provide a technical assessment which is appropriate for the individual college. While the development of the College asset strategy may involve the use of a consultancy it is vital that the process is owned by the college, as outlined above, and that the involvement of key staff in the project enables the transference of the required skills to enable the college to undertake future reviews and revisions of the strategy. Involvement of other stakeholders can be facilitated by conducting interactive workshops as earlier discussed.

7.3.3 Interactive Work Shop

To enhance the asset strategy development process, which will produce a working document that will stand the test of time, there is a need for a planned and structured approach that focuses around key activities and ensures effective engagement of stakeholders. An interactive workshop should therefore be conducted at this stage to critically review the work of the asset strategy development working-group, with a view to ensuring:

- A better understanding of college needs and functions that are necessary to meet those needs
- A better definition of objectives of developing the asset strategy
- A better definition of quality and performance standard
- An improved operational efficiencies and reduced wastage of resources
- Development of innovative and holistic ways of solving the identified problems

- Effective participation of stakeholders, which fosters joint ownership of problems and solutions.

The use of interactive management in strategic planning is especially important in analyzing service strategies and in generating alternative and imaginative options for meeting service needs. These include the identification of options that do not require additional capital investment of physical assets.

Workshop Participants

The workshop should be attended by the major stakeholders that include:

- Principal Officers: Provost, Registrar, Librarian, Bursar and Head of Estate
- Professionals from Estate Department
- Staff of the Bursary
- The Student Affairs officer
- Representatives of the academic staff
- Representative of the non academic staff
- Representatives of the student body
- Representatives of NCCE/Federal Ministry of Education
- Representatives of the community where the college is located

Expected Outputs from the Workshop

The major output from this study is the detailed report, which will contain all the ideas generated that have been worked up and put forward. The report will form the basis on which ideas are put forward for implementation. This study report is the Asset Strategy for the college, which will basically conform to the asset strategy model developed earlier. It is expected to bring about major improvements in the way assets and facilities are managed. It is therefore important to get collective agreement of the participants on the proposed outcomes.

7.3.4 Adopting the Asset Strategy Model by the College

A formal approach to management of assets and the introduction of asset strategy as a tool for effective and efficient management of assets will no doubt bring unprecedented changes in the way assets are managed in the colleges. This expected change will be for example, from an ad-hoc, largely reactive “Maintenance Management“ processes, to improved decision making, based on strategic asset planning. Some of the factors will force changes in the colleges, if the proposed asset

strategy is implemented has been identified and discussed in the next chapter. It is a common knowledge that any attempt to implement a new approach must be expected to face hurdles and challenges, despite the benefits that the new approach may offer. Resistance and hurdles that need to be overcome may range from subconscious resistance to the unfamiliar, to stubborn and orchestrated resistance to change.

The best approaches to address these challenges are through increased and sustained communications and education. For the proposed changes to be meaningful and sustainable, college management and indeed all stakeholders needs to be vitally interested in asset management issues, and particularly the techniques that aid responsible asset management. It is therefore particularly appropriate to introduce the next chapter (*chapter 8*) which discusses organizational change.

7.4 Conclusion

The theory asserts that asset management provides the strategic link between strategic business planning and operational asset management. In the context of any organization or business unit, the focus of asset management is to reconcile the demand for, and supply of, physical asset base and associate support services essential for the delivery of its core products or services. Simply expressed, the principal role of asset management is to support the core business of the organization it is serving.

This assertion has been supported by the field study data which shows how the colleges have been striving to provide assets and associated facilities that are necessary for the delivery of their core business of teaching and learning. To achieve this effectively and efficiently, the theory indicates that an asset strategy needs to be put in place which will serve as the vehicle by which the Colleges will match their asset portfolio to there service delivery requirements. The strategy will enable the colleges to focus on service delivery requirements of the assets rather than on the assets themselves, it will also enable the colleges to establish the asset portfolio that is most appropriate, effective and efficient in meeting the demands of their service delivery requirement.

Field study data corroborates the theory on asset strategy and consequently, an asset strategy model developed prior to the commencement of field work was reviewed and modified in the course of the field studies, to make it more robust and adoptable by the colleges.

An asset strategy model therefore had been developed and explanations given as to how it was validated through a conference that had the participation of stakeholders from the case study colleges as well as other stakeholders outside these colleges. The model had been made simple and user-friendly which has been observed to be adoptable and implementable by the various colleges for the purpose of improving the management of their assets and facilities. Simplification is the strength of all models as it makes reality more comprehensible and generalization of the developed theory more readily achievable. This model portrays a simplified picture of the asset strategy for the Colleges. It is a synthesis of the literature reviews in *Chapters two and three* and the outcomes of the field studies.

The validation exercise provided an opportunity for stakeholders to actively participate in the process of developing the model, thereby giving them a sense of ownership. The exercise had also provided opportunity for sensitization on the need for each college to have an asset strategy, the main purpose of which is to ensure that the colleges have appropriate assets and facilities for meeting the current and anticipated needs of academic and support functions.

Brief explanation of the major phases of the model has been given, as well as the responsibility for the development of an asset strategy. All these are aimed at guiding the colleges to appreciate the need and then develop their own strategies as well as the processes of doing so.

CHAPTER EIGHT

ORGANISATIONAL CHANGE

8.1 Introduction

In the previous chapters, this researcher had argued for the need to change the present practices regarding management of assets and facilities in the Colleges, to ensure that they become more responsive to the needs and aspirations of the stakeholders and to enhance value for money, while also ensuring effective realization of college corporate goals and objectives.

This chapter therefore becomes very important in view of changes that have been proposed which will be a remarkable departure from the current practices in the colleges. Organizational change should not be conducted for the sake of change; such efforts should always be geared to improve the performance of organizations and the people in those organizations. Significant organizational change occurs, for example, when an organization changes its overall strategy for success, adds or removes a major section or practice, and/or wants to change the very nature by which it operates. It also occurs when an organization evolves through various life cycles, just like people must successfully evolve through life cycles. For organizations to develop, they often must undergo significant change at various points in their development.

Theoretical framework for organizational change has been discussed in this chapter, including general discussions on innovation and change and then how organizational change can be implemented in the context of this research. The expected organizational changes that will be brought about as a result of implementing the proposed asset strategy in the colleges have also been identified. Finally, necessary activities precedent to the implementation of the proposed asset strategy has been identified along with time frames.

8.2 Theoretical Framework

The purpose of this part of the literature is to use the aim and context of this innovation to analyze relevant theories and approaches to change and ultimately to

apply the model and accompanying management strategies to ensure its effective implementation and institutionalization. Havelock and Huberman (1978) observed that 'a theory is important because it enables us to predict the success of an innovation by identifying areas of similarity to other innovations tried out in similar settings and also provides us with suggestions and recommendations'.

It is appropriate here, to examine Rondinelli *et al* (1990) contingency theory since, in its use of adaptive management strategies within a systems approach, there is considerable reference to participative problem-solving models. The theory involves assessing three variables: the degree of the innovation; the certainty of the external environment; and the value orientations of the implementers. The aim is to determine the required management strategies, current practices and the gap between them and allow for this gap in formulating implementation action plans.

If the gap between current practice and required management strategy is wide, Rondinelli *et al* (1990) recommend building up management capacity within the organization through changing management processes and structures. While acknowledging that this involves changing deep-rooted values, the strongest barriers to change and must be continued over a long period of time, they are confident that it can be done.

8.2.1 Innovation

The literature abounds with definitions of the term 'innovation'. Most of them label it as something new and planned to bring about change to a system. The concept of the asset strategy model employed in this research is itself not new, but it can be considered an innovation, as the model is being tried in the colleges for the first time.

Recent literature on initiatives seems to come from 'innovative perspective', focusing on organizational change introduced into educational institutions. Attention becomes centred on the characteristics of the innovation and the organization into which it is introduced. The term 'innovation' has a distinct meaning from 'change', as the following definitions suggest:

- *“An innovation is something which is new and is intended to bring about improvement. Although not all change is improvement, all improvement involves change.” Stoll, L. & Fink, D. (1996) (Stoll 1996)*
- *“The essential difference between innovation and change lies in the fact that the innovation is planned, the idea being that through planning, one can increase the chances of bringing about desired change.” Havelock, R.G. and Huberman, A.M. (1978)*
- *“It is a process, deliberate and intentional.... and as a result of the experiences, views and perspectives of those who will be using it, the innovation becomes a dynamic process which can be constantly refined and redefined...the term connotes novelty from the point of view of those who use it” Morrish, I. (1976)*

Before delving further into a conceptual underpinning, it is essential to note that an educational innovation may not necessarily work as the theories suggest. “The uniqueness of the individual setting is a critical factor - what works in one situation may or may not work in another”. As such, theories should be applied with an understanding that they do not necessarily possess an ironclad guarantee of effectiveness. Their adoption should depend on a number of factors such as the organizational culture, resource availability, and the nature of the innovation itself. Furthermore, an innovator should be ready to accept the weaknesses of the theories. Therefore at any stage in implementation, one should strive to be pragmatic bearing in mind that theoretical perspectives are only a set of generalizations that may or may not work in a given circumstance. Considering this position, this researcher therefore did not attempt to develop asset strategy for adoption by the various colleges; instead an asset strategy model had been developed so that individual colleges can be guided in developing their own asset strategies. This will help to ensure a careful and feasible innovation.

8.2.2 Change

On the perspective of change, Hewton (1988) looks at two sources, which can stimulate colleges to adopt new methods. He lists these sources as ‘external change’ and ‘internal problems’. He discusses Erut’s (1995) theory that external stimuli are often associated with the ‘change paradigm’ while internal stimuli are associated with the ‘problem solving paradigm’. Hewton (1988) addresses both sources in his model

of staff development, using teachers themselves to identify and address their problems.

With this in mind, the phenomenological approach and problem solving approach to innovate have the strongest likeness to this research work. Both approaches operate through a focus on a participative process where those involved define and address needs, and are adopted here, to bring about changes in management of college assets. For it to be effective and meaningful, change should be executed in cyclical manner, going from diagnosis of the problem to planning and implementation of solutions, and after evaluation, the process is adjusted and repeated until goals are achieved.

Fullan (1992) suggests that change is endemic.

“.... External events are always happening to individuals, whether they like it or not, so ability to manage change is essential skill in post modern society. Change is mandatory, growth is optional. Thus we do not have a choice between change and non-change, but we do have a choice about how we respond”.

Moreover, one cannot ignore the claim that all change involves loss, anxiety and struggle. Fullan (1994) state that “change is neither straight forward nor without personal costs”. The above statement attests to the considerable confusion, anger and uncertainty that change often stirs up. Yet Whitaker suggests that change must not be regarded as something that has to be feared, resisted or avoided. He stressed that change can present new opportunities and exciting prospects. This is the central issue in all the workshops and conferences conducted during the field studies, where stakeholders are sensitized on the need for the proposed changes. Fullan (1994) writes that the secret of growth and development is how to contend with forces of change “...becoming forces of change rather than victims of change”. This implies that coping with change effectively requires knowledge and insights about the change process.

An important consideration is the often-stated phrase that the process of change can connote different realities to each individual. Phenomenologist caution that it is essential to allow those involved to create their own meaning of change. Not all people will want to change and the changes will be different to each. The multiple realities of change will bring about conflicts and disagreement but all must be given

the opportunity to react and interact with others and form their own position even if it means rejection of the innovation. However it is comforting to find support in Fullan (1994) who states that rejection does not necessarily signify failure, but must be used to illuminate knowledge about the change process in its context.

From discussions in the previous chapters, it is clear that the proposed asset strategy will obviously bring about changes in the way the colleges manage their assets and facilities. The expected changes will be brought about as a result of the following factors, among others:

- ***The proposed Asset Strategy is a Structured Asset Management Framework*** – At the moment, no structured formal asset management framework exists in the colleges to enable procurement, maintenance, renewal, enhancement and disposal decisions to be made in an informed and coherent manner.
- ***Level of Asset Management Application*** – The knowledge of the asset base at a strategic and tactical level and the college capabilities in asset management at a strategic and tactical level needs great improvement. The current practice has to change for better, with the adoption of Asset Strategy
- ***Life-Cycle Approach*** – Currently, the focus of asset decisions in the colleges is the capital cost of an asset rather than the total life-cycle costs associated with its acquisition, use and disposal, as will be required if the Asset Strategy is adopted
- ***Non Asset Solutions*** – The proposed Asset Strategy requires colleges to always look for non asset solutions to their service delivery requirements. At the moment, insufficient regard was observed to be given to alternatives to asset acquisition or ownership. Devising non-asset options will challenge traditional concepts and assumptions about the delivery of services, and enable innovative methods to be developed.
- ***Demand Management*** – The proposed Asset Strategy requires colleges to properly study and effectively manage demands for assets by adopting strategies that will among others, reduce the unreasonable sharp rise in student enrolment.

- ***Centralization of classroom/lecture hall control*** – It was observed that while some classrooms/lectures halls in the colleges are grossly over utilized others are very much under utilized. This is attributed lack of centralization of control of these facilities as will be required if the proposed asset strategy is adopted.
- ***Funding and Management Finances*** – Colleges will be required to vigorously pursue additional sources of funds, including improvement of local revenue generation, to be able to effectively implement the proposed asset strategy. They will also be required to be more open and transparent in the management of their finances.
- ***Public Private Partnership*** – The Colleges will be expected to collaborate with the private sector and other relevant government agencies in the management and even provision of some of the facilities, such as student hostels, sports facilities, etc.
- ***Staff Training*** – A formal and structured Staff training programme is required to be developed and implemented in each College adopting the proposed asset strategy, as opposed the current practices.

Initiation of Change

Using Fullan's framework, there are factors, which influence the initiation of change projects. But he used same precautionary measures and also advised that innovation should avoid the following pitfalls;

- Change adopted for opportunistic reasons, as it will have little likelihood of follow through
- Large scale change that bite off too much, as it can easily become vague
- Narrow perspective, which may restrict those involved
- Imposed change which lacks meaning to those involved

Instead, he argued that strong advocacy needs active initiation and a clear model for proceeding must support the initiation phases. He explained that initiation is more likely to succeed if relevance, readiness and resources are established at the launch

stage. However, this is the ideal situation and it is not always possible to sort out the three elements in advance. This is represented in the Figure 8.1:

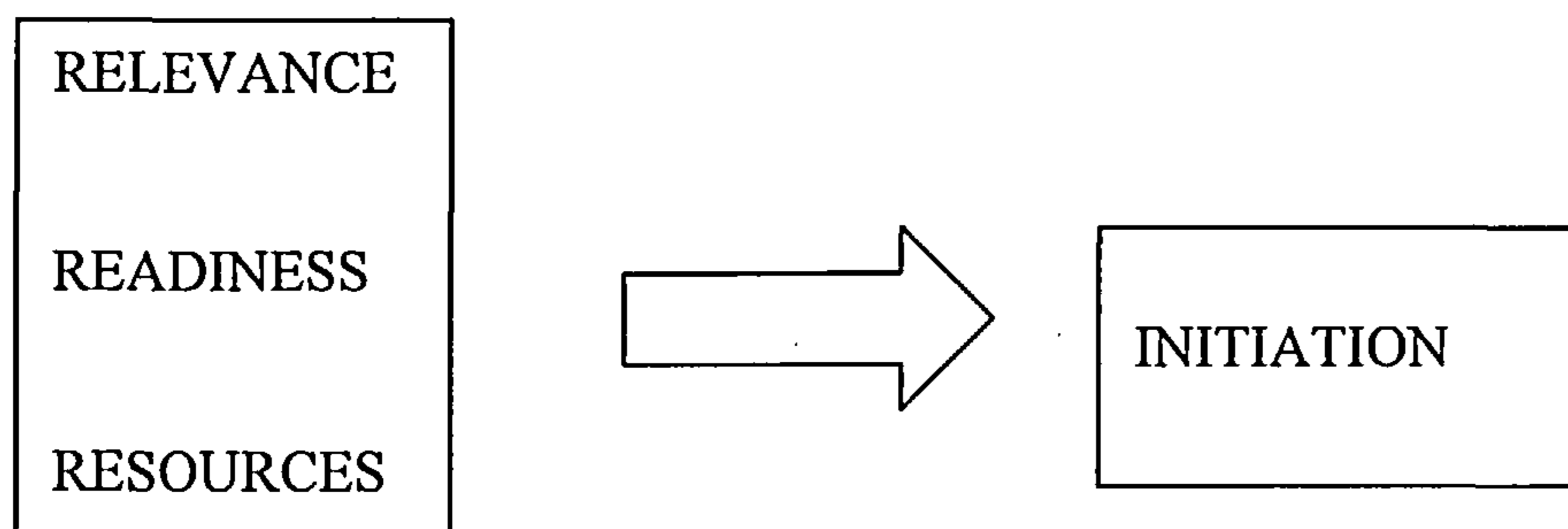


Fig 8.1: consideration for initiation:

Features for Effective Change

Warwick, et al (1991) from a study of failed innovations, has described necessary features for the implementation of innovation, which is adopted for this research as follows:

- Organisation intelligence – the presence of feed-back mechanism for self monitoring and evaluation at all stages of innovation
- Policy setting process – persons with influence on policy and implementation must be participants in formulation and design of innovation, these include the Governing Council, Management Committee and the NCCE
- Task and Technologies – resources must be adequate so that those involved can have the means to act
- Management and Organisation – the innovation must be integrated into administrative structure and routine of the College
- Field Implementers – those directly involved (staff of estate department) must know the purpose and must be able and motivated to carry it out
- Client (Governors and members of management) – must be willing to tolerate and provide for whatever is involved
- Culture – the College as well as society’s culture must support the innovation
- Politics – local and national politics must be willing to support the change, the innovation will bring

Barriers to Change

In the attempt to manage change and achieve improvement, some factors, which impede development of an innovation, are given particular mention in the literature. These have been summarised by West and Ainscow (2000) as: “lack of understanding, lack of necessary skills, existing attitudes, limited resources and

inappropriate organisation”. The list of possible barriers is not exhaustive. This research considers here, those issues that are most obvious. Clearly what is required is an awareness of specific barriers, with a view to addressing the change process as these factors are experienced.

8.3 Implementation

Theorists and practitioners have identified a number of factors that either enhance or inhibit effective implementation of planned change in educational institutions. According to Stromquist (1996) “literature on educational change often reveals the role of external forces, especially, intellectuals, grassroots groups and political representatives in bringing new ideas and practices into educational institutions”. Fullan and Stiegelbauer (1991) also acknowledged that external forces could influence change in educational institutions. However, the success of any innovation whether borrowed from external forces or developed from within an institution is dependent upon many factors such as: perception of need; clarity of the features of an innovation; organisational incentives; increased ownership by its implementers; ongoing technical assistance and permanent monitoring.

The characteristics of the proposed change itself are a factor in implementation. According to Fullan (1994), the “perceived impact of the change itself on potential users would determine the level of its acceptability. In addition, the size, complexity, prescriptiveness and practicality as well as recognition for need to effect change are essential in determining the success of its implementation”. In other words, it is necessary to ask whether the proposed change addresses priority needs. Fullan (1994) suggests that qualitative and practicable innovations are most likely to succeed. According to him, practical projects are those that address salient needs, fit well with stakeholders’ situations, and those that are well focused as well as have concrete attainable possibilities.

In support of these factors, Warwick et al (1991) identified a proper planning “that asks and effectively answers questions such as what is to be done, how and by whom as necessary components for effective implementation of an innovation”. Louis and Miles (1992) have also noted the need for a vision building. “This is a situation

where the values and needs of what and how to improve in an institution are infiltrated". However, according to them, this vision building should be a constant process with a continuous, shaping and reshaping. Fullan (1994) divides the vision building in to two categories: a sharable and shared vision; and the shared vision of the change process. The former deals with what the institution could look like, which provides directions and driving force for change as well as the criteria for judging whether a change occurs. The later on the other hand, deals with the general process for achieving the sharable vision. Thus, for this research work to succeed, there is a need to convince stakeholders of its indispensable need, with a clear vision both shared and sharable of what needs to be done and finding a feasible way of achieving it.

An evolutionary planning approach is another significant factor for a successful implementation. This is a situation where both top-down initiative and bottom-up participation are integrated in the sharable vision. This suggests that for a successful change to result, it is unwise to have a highly specified planning. Fullan (1994) suggested that implementation should "have a plan, but learn by doing". This suggestion indicates that having a full-fledged blue print might not necessarily work since it hardly takes care of unforeseen circumstances. Also, as Fullan (1994) observed, "change is a journey, not a blue print". Recognising this earlier, Rondinelli et al (1990) cautioned that planners should design projects that are dynamic and changeable as managers learn from experience. They noted that the World Bank findings strongly suggest that straightforward solutions are mostly impracticable in solving educational problems. In Nigeria, "this blueprint syndrome is largely responsible for the failure of the country's new education system-the 6-3-3-4, and the Universal Primary Education (UPE) programme" Aiyepku, T.F. (1989). This is because the Government overlooked certain likely problems that could hinder a successful implementation. The present innovation has learnt from these failures by making sure that its design allows for evolutionary development. It incorporates what Fullan (1993) described as "a learning attitude and structure for problem-solving" as the project goes along.

The need for initiative taking and empowerment is also identified as a necessary ingredient for a successful and sustainable innovation. A major step to

implementation is the ability to get people to interact towards a purposeful goal. Louis and Miles (1992) found that initiative comes from different sources, but power sharing remains a corner stone at the implementation stage. The involvement and active participation of all concerned, the delegation of authority and resources to steering groups and maintaining active involvement with the group is essential in implementation. In support for empowerment, Warwick et al (1991) also suggested that successful innovations require transactions among policy proponents, implementers and others whose support is necessary for an action to happen. The lack of empowerment through active involvement of implementers and those concerned is believed to have been greatly responsible for the failure of some educational innovations in Nigeria. Hence, a shared vision, according to Fullan (1993), must evolve through active interaction of organization members and leaders.

The above positions suggest that the governors, management, staff, students and all other stakeholders in the colleges have strategic roles to play in ensuring a successful implementation of the asset strategy innovation, and this has been adequately addressed in the use of interactive workshops, involving the major stakeholders in developing the asset strategy. Stakeholders should be involved appropriately. The literature says that when people are involved, they're more committed. It's also clear that the proposed changes to the way assets are managed in the colleges require broad involvement and input from across the stakeholders. But involvement won't save a change that doesn't add value, involvement must have a purpose. The purpose and benefits of the proposed strategy and the expected roles of the various stakeholders to ensure its successful implementation therefore needs to be effectively communicated.

Since it is proposed that only a few people will be selected and saddled with responsibility of developing the asset strategy, not every stakeholder will therefore participate in its development, but researchers who are famous for their studies on the effects of involvement on goal achievement conclude that people don't have to participate to be committed. But they do need to trust the people setting the goals, believe that the goals will lead to greater performance, have access to feedback, and have control and ownership of the steps and actions for achieving the goals. In other words, there needs to be participation at the level of getting things done. Successful

changes always involve the people affected because they have important contributions to defining or implementing the change.

As Stromqueist (1996) observed, educational innovation should be seen as involving a complex set of actors and actions. She further noted that support from the leadership of the institution involved is a strong incentive to foster the implementation of change. However, Fullan (1993) observed that innovations die prematurely when leadership teams dictate them or when they attempt to impose a false or superficial consensus. He stressed that a successful change is a process of overcoming isolation as well as not succumbing to groupthink. He is of the view that a change is “too important to leave to leaders and so-called experts”. Fullan (1993) strongly posits that it is only by all individuals taking action to change their environments that there is a chance for meaningful and sustainable change. Hence, collaborative work culture is essential for raising morale and enthusiasm as well as for opening a room to experimentation and increased sense of efficacy. Warwick et al (1991) further supported this when they stated that implementation is likely to succeed if “those responsible for it are ably motivated to carry it out. Perhaps the best way of motivating them is to actively engage them in the entire process. This is likely to make them see the innovation as their products and its success as theirs”.

This innovation of developing an **asset strategy model** is intended to help improve the effectiveness and efficiency of service delivery for the overall goal attainment within the limited resources available. The proposed changes are in respect of how assets/facilities are managed such that it will have positive effects on the overall structure of the Colleges. It will provide an avenue through which various stakeholders within each college can appreciate and support the need to develop and implement an asset strategy for their college.

Colleges developing their individual strategies based on the model are expected to observe the need for a participative approach in doing so. This is in line with position of Fullan (1994) and Warwick, et al (1992) and other sources earlier discussed, which advocates participatory approach in appraising the problem, identifying the strategic needs, and working out the process of solving the existing problems, for changes to be effective and enduring. The participatory approach is adopted based on the

assumption that the major source of knowledge is understood to be people themselves, based on their own life experiences, and on the basis of their own involvement in the study of the situations surrounding them. The methods for situational analysis is such that people themselves will think, reflect on the problems at hand, build capacity for critical thinking and debate, and to develop in themselves confidence as well as the commitment to act for the desired change.

The approach to innovation in respect of this asset strategy model necessitate that all involved have to be willing to relinquish their accustomed positions of control and being controlled to allow flexibility. The adage 'old habits die hard' is the foremost consideration here and therefore openness to change cannot be taken for granted. It is anticipated that in the context of this asset strategy model, this openness to change will take time, but have to be encouraged. Stakeholders are expected and allowed to feel a sense of ownership of the process. The best approach to address resistance is through increased and sustained communications and education. The opportunity for open discussion at interactive workshops, where they generate their own priorities, and set their own agenda for what is to be changed, how and when, will hopefully increase their openness to change.

8.4 Monitoring and Evaluation

The need for monitoring and evaluation of the implementation of an innovation should also be seen as important as the implementation itself. Louis and Miles noted that every serious innovation has problems, but a successful implementation has to deeply engage in problem-coping and solving; for example, redesign, creation of additional roles, the provision of more time and assistance, and so forth. To do these demands a continuous monitoring and evaluation at all stages. Successful innovations monitor and evaluate what has been achieved as well as what needs to be done. In the process, it also evaluates everyone's involvement in the entire implementation. According to Fullan (1994), monitoring serves "two functions: the provision of access to good ideas by making information on innovative practices available; the exposure of the new ideas to a close examination and helping to avoid or eliminate mistakes

while developing promising practices.” He suggested a participative monitoring and evaluation where all stake holders are involved in the entire process. After developing an asset strategy therefore, a College needs to put up a structured monitoring and feedback system to ensure effective implementation.

8.5 Activities Leading to the Development of Asset Strategy

Asset management is an evolving process that improves as the condition, performance and the operational cost requirements of assets become better understood. To ensure that supporting activities are improved and incorporated into asset management plans, an improvement plan is required to accomplish this in a planned and progressive manner.

The knowledge of own assets and asset management capability levels in all the colleges studied are similar (average for knowledge and low for capabilities). For a college to be able to effectively develop its own asset strategy therefore, a series of asset management activities precedent to the strategy development needs to be realized. These activities can be summarised as follows;

Stage 1

Basic Awareness and Skills Improvement: As earlier stated in this chapter, major step to implementation of change is the ability to get people to interact towards a purposeful goal. The involvement and active participation of all concerned, is very much essential in implementation. For stake holders to actively get involved in the development and implementation of the strategy therefore, they need proper sensitization on the needs and benefits of the proposed changes at the initial stage. Staff of Works/Estate Departments should be given relevant training and be motivated to be able to successfully participate in the development and implementation of the asset strategy.

Stage 2

Identification of strategic goals and service delivery objectives: The next stage should be the identification and proper documentation of college corporate goals and

objective. The asset objectives of the College should also be identified and documented. These will serve as the main reference points in all subsequent activities of the asset strategy development process.

Stage 3

Basic Asset Register: The third stage in the process of preparing for the development of an asset strategy should be the setting up of a basic asset register. All college assets being used to deliver the service need to be identified and registered. How effectively these assets support service requirements also have to be determined and properly documented.

Stage 4

Basic Asset Management: The fourth stage of the preparation process should involve optimizing data collection, improving the asset register and introducing some basic asset management tools such as risk management, demand management, value management, etc. Capital development, maintenance and disposal plans should also be documented while non asset solutions be identified and properly documented.

Stage 5

Develop asset strategy: The fifth and final state in preparation for the asset strategy development should be the constitution of the strategy development committee and the implementation committee that will be saddled with the responsibilities of developing and monitoring of the successful implementation of the asset strategy and then the development of the asset strategy, based on the proposed model.

Table 8.1 shows the various stages and milestones that a college needs to develop over a period of time. The time it takes for each stage may vary from College to college, depending on human and financial resources available, among other factors. However, most colleges, with the assistance of consultants, would be able to successfully develop it within a period of two years.

Stages	Milestones	Month													
		2	4	6	8	10	12	14	16	18	20	22	24		
Stage 1 Basic Awareness and Skills Improvement	<ul style="list-style-type: none"> - Sensitize stakeholders on importance and process involved in developing Asset Strategy - Re-train Estate Department staff 														
Stage 2 Identification of strategic goals and service delivery objectives	<ul style="list-style-type: none"> - Identification of Corporate objectives/academic plan - Needs analysis/status assessment - Setting basic strategy/asset management objectives - Asset data classification/collection priorities confirmed - Asset management improvement programme adopted 														
Stage 3 Basic Asset Register	<ul style="list-style-type: none"> - Set up basic register/asset management information system - Identification of all assets - Basic data captured - Asset replacement cost/timetable determined - Initial asset management plans - Current levels of service identified - Basic valuation prepared 														
Stage 4 Basic Asset Management	<ul style="list-style-type: none"> - Improve attribute data - Introduce demand management - Introduce risk and value management - Introduce basic condition assessment - Valuation based on condition - Optimise data collection - Maintenance history data identified - Renewal decision making process documented - Determine target level of service - Costs captured against assets - Identify and document non asset solutions 														
Stage 5 Develop asset strategy	<ul style="list-style-type: none"> - Set up asset strategy development committee - Develop asset strategy, based on model - Set up strategy implementation committee - Implement asset strategy 														

Table 8.1 Asset management milestones for the colleges:

8.6 Conclusion

This chapter discussed organisational change and innovation, if adopted, is intended to bring about changes in the way assets are managed in the Nigerian Federal Colleges of Education. The chapter examined change from the point of view of Fullan and other theorists in which phenomenology plays an important part in the presentation of factors that are related to the initiation and implementation of change. Discussions of the features of successful innovation, as well as barriers to change are presented. These are discussed in the light of the context, so as to present an understanding of the preparation for the introduction of an asset strategy approach to improving asset management in the Colleges.

Expected organizational changes in the colleges has also been identified and presented. The next chapter discusses the conclusion and recommendations from the study.

CHAPTER NINE

CONCLUSION AND RECOMMENDATIONS

9.1 Introduction

In this final chapter of the thesis, the achievement of aims and objectives of the research have been addressed. Also the implications of implementing the developed asset strategy model in the colleges have been examined. The chapter concludes with the summary of contributions that has been made to knowledge and recommendations for further research.

9.2 Achievement of Aims and Objectives

The aims and objectives of this study have been achieved through literature reviews and the field study exercises, resulting in the development of an asset strategy model as discussed in the previous chapters. This section therefore gives a summary of how each of these aims and objectives had been achieved.

9.2.1 Aims of the Study

The main aim of this study as stated in chapter one is to develop a framework for a structured, integrated and holistic approach to managing physical assets in the Nigerian Federal Colleges of Education, which will ensure an effective and efficient alignment of assets with the service delivery requirements of the colleges. This aim has been achieved with the development of an Asset Strategy Model (*Figure 7.2*) for the colleges to emulate in developing their individual asset strategies. This was done with the active participation of College stakeholders, to ensure that colleges adopting it are able to effectively align their asset planning and management with service delivery priorities and objectives, so that all assets support services in the most appropriate, effective and efficient way.

The model which was first developed (*Figure 4.4*) prior to commencement of the field studies was subjected to critical analysis, resulting to some modifications during interactive workshops organised in each case study college to review field study data as discussed in *Chapter six*. It was further reviewed during the validation conference (*Chapter seven*) which took a holistic view of the model, resulting to the final

production of an Asset Strategy Model as given in Figure 7.2. Due processes for developing the strategy had also been provided in *Chapter seven*, along with the key components of the strategy, for the guidance of the Colleges.

Asset Strategy, according to the literature, enables organizations to focus on service delivery requirements of the assets rather than on the assets themselves, it also enables organizations to establish the asset portfolio that is most appropriate, effective and efficient in meeting the demands of their service delivery requirement. The development of Asset Strategy is therefore observed to be a critical stage in the Colleges' strategic planning. It is viewed as a vehicle by which the colleges can match their asset portfolio to there service delivery requirements.

9.2.2 The main objectives of the study

- 1. Examine the state of physical assets and facilities in the Federal Colleges of Education and review their ability to meet the service delivery requirements of the Colleges:** This objective has been achieved through the conduct of field studies in some selected colleges and presentation of findings as discussed in *Chapters six and seven*. The field study data and interactive workshops had provided the required information regarding the status of assets and facilities in the Colleges, knowledge of the asset base at strategic and tactical levels and the College's capabilities in asset management. These are important ingredients that contributed to the development of the Asset Strategy.
- 2. Examine the current management practices and levels of knowledge of the assets own and rented by the colleges:** This objective has been achieved by conducting field studies discussed in *Chapter six*. Findings from the field studies have been discussed in chapter seven. The field study exercises had revealed a number of weaknesses in current approaches in the management practices of operational assets in the colleges. Even though the Colleges had progressively improved control over their assets by developing more reliable asset records and introducing better procedure for capturing asset transactions, using NCCE guidelines, there is still much room for improvement to be able to

meet up with Asset Management practices. It was noted that the Colleges had yet to take a strategic approach to Asset Management. In particular, the studies had noted some key weaknesses, among which are:

- reactive approach to management;
- inadequate asset information for informed decision making;
- lack of performance monitoring.

3. Identify the main factors that inhibit effective and efficient management of assets and facilities in the colleges: This objective too has been achieved through conduct of field studies as discussed in *Chapter six* and findings presented in *Chapter seven*. Some of the inhibiting factors identified include insufficient funding, poor record keeping, sharp rise in student enrolment without a corresponding increase in assets or in maintenance budgets, reactive approach to management of assets, etc.

This research study therefore advocates that the above weaknesses are symptoms underlying a persistent problem - the lack of a strategic view of the role of physical assets resource within the context of College's business and academic plans. Integration of asset strategies into operational or business plans will establish a framework for existing and new assets to be effectively utilized and their service potential optimized

4. Examine the existing literature in respect of Asset, Estate and Facilities management, with a view to drawing lessons that will help improve management of assets in the colleges in question: This objective has been achieved by review of relevant literature in *Chapters two and three* and also the discussion of organizational change in *Chapter eight*. Literature reviews had been carried out to provide proper understanding of asset management and its associated estate and facilities management practices. This is with the view to relating the practices to what is obtained in the Nigerian Federal Colleges of Education.

Asset Management has been projected in the literature as an evolving process that improves as understanding of asset condition, performance and operational cost improves, in conjunction with decision-making process, and its principles are derived from common sense and are based on the life-cycle approach. The assumption upon which the principles are based is that assets exist only to support programme delivery. Estate and Facilities Management share common objective with Asset Management in providing an enabling workplace environment to fulfill corporate objectives. The key starting point to ensure this is the case in respect of the colleges' assets therefore is to establish a link between programme delivery and assets. Literature has shown that this can best be achieved through the development of asset strategies. These literature reviews then formed the basis of developing an interim Asset Strategy model in *Chapter four*, which was subsequently modified in *Chapter seven*.

- 5. Develop management strategies that will enhance effectiveness and efficiency of assets in meeting service delivery requirements of the Colleges:** this objective has been achieved. It is in fulfilment of this objective that asset strategy model was developed to guide the Colleges to establish long term plans for the developing and managing their assets and facilities in an optimum way in relation to the colleges' academic plans and business needs. It is based on an analysis of the assets and facilities, the academic plan, current resources and future opportunities. The responsibilities and all the processes involved in developing an Asset Strategy has been developed in *Chapter seven*, along with the model to provided necessary guidance to the Colleges.

For the asset strategy to be adopted and implemented in the Colleges, the research had recognized the need to involve the major stake holders in its development. That will give them sense of ownership which will engender commitment for its implementation. Therefore, involving and empowering staff, students and other stakeholders in the change process becomes necessary as discussed in chapters four and seven. The opportunity for open discussion at interactive workshops, where stakeholders generate their own priorities, and

set their own agenda for what is to be changed, how and when, will increase their openness to change.

9.3 Implication of Research to the Federal Colleges of Education

A key outcome in implementing Asset Strategy will be the assurance that existing assets are being managed and maintained effectively and efficiently, and that they fully support the delivery of College's services. The physical, operational, functional performance of the assets will be monitored continually and programmes put in place to address performance deficiencies or to initiate programmes for performance improvement.

The processes for the development of an Asset Strategy for a College and responsibilities for developing such a strategy had been fully discussed in *Chapter 7*.

The key points of this initiative are:

- an Asset Strategy needs to be part of the College's corporate strategy as outlined in its corporate goals, supporting the achievement of strategic aims and objectives by the setting of clear asset objectives for the usually three year planning period covered by the College Development Plan;
- the College should be clear, through a process of internal consultation based on the overall strategy for the College, of what the Asset Strategy will deliver;
- the strategy should be developed in close consultation with representatives from the Academic Community, Finance, Planning, Estates Department and the NCCE;
- to ensure successful implementation, the Asset Strategy requires the support and approval of the Governing Councils;
- the Asset Strategy should aim to cover a reasonably long timescale and certainly no less than the period covered by the Strategic Planning cycle i.e. three years and should indicate a future point at which the College will undertake a formal review;
- the strategy should include clear objectives for the assets for the planning period. These may take the form of longer term aspirations and goals and also short term objectives to be achieved within the three year planning cycle of the Development Plan;

- short term objectives should be Specific, Measurable, Achievable, Realistic and Timed (SMART) to enable the Colleges to determine progress and assess performance against the intended outcomes;
- the Asset Strategy should be supported by a full performance assessment of each asset unit, including size, condition, running costs, value, fitness for purpose, space utilization, tenure, title restrictions, etc;
- the process of developing the Asset Strategy may generate a large number of options, but comprehensive appraisal should be focused on a small number of realistic options;
- the Asset Strategy should be developed within the context of the College's Financial Strategy and include a robust funding framework to enable the achievement of the stated objectives.
- introduction of Public Private Partnership (PPP), currently being pursued by the colleges to bring private sector funds and efficiency into the development and management of some physical assets, particularly the student residences, will not affect the future implementation of the model as given in Figure 7.2. The developed Asset Strategy Model is made flexible enough to accommodate such emerging global trend in the development and management of public assets and facilities.

Asset strategies should therefore be relevant, up to date and sustainable. They should also be affordable and feasible within the funding framework of both public and private resources. The strategy should be supported by a plan to assist its implementation and be subject to ongoing monitoring and review to ascertain the extent to which the stated objectives have been achieved.

The introduction of asset management practices, particularly Asset Strategy in the Colleges, though clearly a novel approach that will bring about improvements in the effective and efficient management of College assets and facilities, such changes to the accustomed approach are likely to face resistance. The required changes and improvements are of the same nature as those that took place in many other establishments, and can therefore happen in the Colleges. However, if these changes are to occur, the attitudes of the traditionally mind-set in the Colleges will have to be

overcome. This will not happen over night. It is anticipated that in the context of this Asset Strategy Model, this openness to change will take time, but have to be encouraged.

Stakeholders are expected and allowed to feel a sense of ownership of the process. A systematic and sustainable programme of raising awareness and developing skills needs to be put in place. The opportunity for open discussion at interactive workshops, where they generate their own priorities, and set their own agenda for what is to be changed, how and when, will surely increase their openness to change and the future will see the gradual demise of the traditional approach to managing College assets, as the benefits of the new approach cannot be ignored in terms of cost savings and effectiveness and efficiency in the delivery of services.

After the development of the initial Asset Strategy, also as more information becomes available or improved system and processes are in place, the sophistication of the asset strategy will improve incrementally to an optimum level, appropriate to needs of the particular College.

9.4 Contribution to Knowledge

This study has contributed to knowledge in a number of ways. These include:

1. The thesis revealed how assets and facilities are managed in the Nigerian Federal Colleges of Education and the similarities and differences with what is applicable in the context of Asset Management practices as documented in the literature.
2. The study developed an **Asset Strategy Model**, including the processes and responsibilities for the development of such a strategy by individual colleges. A college adopting the model will be able to develop a long term plan for developing and managing its assets and facilities in an optimum way in relation to the College's Academic Plan and business needs. The novelty of this model is that it has been made very simple, flexible and user-friendly. The Colleges can easily adopt the model and develop their respective asset strategies, notwithstanding, their current level of competency in Asset Management.

3. Bringing together, Estate and Facilities Management concepts along with the Asset Management concepts, to produce a management system that will ensure effective, efficient and economic performance of assets and facilities in Nigerian Federal Colleges of Education
4. The research had successfully tested the developed Asset Strategy Model in the case study Colleges and other Colleges not involved in the study, and also raised awareness on the need for Colleges to develop their own asset management strategies.

It is believed the adoption of the proposed asset Strategy Model by the colleges will bring about tremendous improvements in the effective and efficient management of their assets and facilities for better service delivery.

9.5 Recommendations for Further Research

It is recommended that research should continue in the area of improving the management of assets in the Nigerian Institutions of Higher Learning, with particular emphasis on:

- Developing structural and supportive legislative reforms that will facilitate development and adoption of Asset Management practices
- Developing relevant training programmes for professionals that are responsible for managing assets and facilities in such institution
- Developing effective and efficient monitoring systems for asset management performance in the institutions to ensure improvements are achieved.

REFERENCES:

ACU (2005) Strategic Estate Management in UK Universities. The ACU Bulletin Volume, DOI:

Aiyepetu, T.F. (1989) 6-3-3-4 System of Education: MacMillan Press: Ibadan (Nigeria):

Alexander, K. (1996). Facilities management: Theory and Practice. London and New York, E&FN Spon.

Amaratunga, D. a. B. D. (2000). "Assessment of Facilities Management Performance in Higher Education Properties." Facilities 8(7/8)

ANAO (1998). Asset Management, Australian National Audit Office

Argenti (1980). Practical Corporate Planning. London, Allen and Unwin.

Austrroads. (2006). "Guide to asset Management." from www.onlinepublications.austrroads.com/au

Baker, T. (2002). Key Performance Indicators Manual: A practical Guide for Best practice Development, Implementation and use of KPIs. Crows Nest, NSW, Allen & Unwin.

Barrett, P. a. B., D (2003). Facilities Management: Towards Best Practice. Oxford, Blackwell Science.

BC, M. (2002). Capital Asset Management Framework. M. o. Finance, Ministry of Finance, British Columbia.

BIFM. (2004). "Facilities Management." Retrieved June, 2006, from www.bifm.org.uk.

Bogdan, R. C., & Biklen, S. K. (1982). Qualitative research for education: An introduction to theory and methods. Boston, Allyn and Bacon, Inc.

Brackertz, N. (2002). Moving Towards Integrated Facilities Management Tool to Evaluate Facilities for Service Performance in Local governments. Facilities Management and Maintenance, The 2002 Global Symposium, CIB Working Commission.

Butt, H. a. P., B. (1985). Value for Money in the Public sector: The Decision Maker's Guide. London, Blackwell science

CEM, R. (2004). "Facilities Management." from www.cem.ac.uk

Dane, F. C (1990) – Research Methods , Brooks/Cole Publishing Company

Darlington, Y. S., D. (2002). Qualitative Research in Practice. Mc Graw-Hill, Open University press.

Descombe, M (1998) – *The Good Research Guide: for small-scale social research projects*, Great Britain, Guildford & Kings Lynn

DPW, Q. G. (2003). *Asset Management Policies and Systems*, Department of Public Works, Brisbane.

DPW, Q. G. (2006). *Strategic Asset Management*, Department of Public Works, Queensland Government, Australia

DPWS (2001). *Total Asset Management Manual*, NSW Department of Public Works and Services: Sydney.

DTF (2005). *Asset Management*. V. S. g. Department of Treasury and Finance, Australia, Victorian Government Asset Management Series

Eden, C. a. R., J. (Eds.), Ed. (1990). Tackling Strategic Problems: The role of Group Decision Support. London, Sage.

Eraut, M. (1995) “In-service teacher Education” in L.W. Anderson (Ed) International Encyclopaedia of Teaching and Teacher education 2nd Ed. Columbia, USA: Pergamon

Everards, G. a. F., P. (2003). Corporate Integrated resource Management. The European Facilities Management Conference, May, Rotterdam, The Netherlands, TEFMC.

Executive, S. (2005). *Local Government Act 2003 - Asset Management Under Best Value Advisory Note*, Scottish Executive

Feagin, J., Orum, A., & Sjoberg, G. (Eds.). (1991). *A case for case study*. Chapel Hill, NC: University of North Carolina Press.

FEFC (1996). *Estate Management in Further Education Colleges*. F. E. F. C. f. England, NAO, Coventry

FEFC (1997). *Effective Facilities Management: A Good Practice Guide*. F. E. F. C. i. c. w. t. N. A. O. (NAO). London, Stationary Office.

FEFCW (2001). *Estate Management Manual*. E. a. L. Wales, Further Education Funding Council for Wales

FHWA (2002). U. S. D. o. Transport, Federal High Way Administration

Fullan, M. (1993) Change Forces: London: The Falmer Press

Fullan, M. (1994) “Implementation of Innovations” in Torstein, H. & Neville

Fullan, M.G. & Stiegelbauer, S. (1991) The New Meaning of Educational Change: London: Casell

GAMC (2003). Total Asset Management Manual. D. o. P. Works, New South Wales Government.

Gelnay, B. (2002). Facility Management and Design of Victoria Public Hospitals: applying and Extending the Global Knowledge base. Facilities Management and Maintenance, The 2002 Global Symposium, CIB Working Commission 070 Kidlington, Oxford: Elsevier Science Ltd Vol 5

Griffith, U. o. (2004). Strategic asset Management Plan. O. o. f. management, University of Griffith, Australia

GSA (2004). "Federal real Properties Council (Executive Order 13327)."

GSA (2005). Best Practices, U.S. General Services Administration

Haas, R., Snelgrove, L. (2000). Application of Asset management to Preservation of Urban Infrastructure. Water and Sewage Infrastructure Systems: Challenges and Solutions, Ottawa, Ontario, National Research Council, Canada.

Havelock, R.G. (1979) The Change Agent's Guide to Innovation in Education; Education Technology Publications

Havelock, R.G. and Huberman, A.M. (1978) Solving Educational Problems: The Theory and Reality of Innovation in Developing Countries: New York: Praeger Publishers/UNESCO.

HEFCE. (2000). "Estate Strategy - A Guide tom Good Practice ", from www.hefce.ac.uk/pubs.

Hewton, E. (1988) School Focused Staff Development: Guidelines for Policy Makers: London Falmer Press

IAM. (2003). "Asset Management." at www.iam-uk.org.

IIAM (2006). International Infrastructure Asset Management Manual. London, Institute of Asset Management.

IFMA. (2003). "What is Facilities Management." 2004, from [www.ifma.org/what is fm](http://www.ifma.org/what_is_fm)

IPFMA. (2003). "What is Property Facility Management." from www.ipfma.com

Johnson, G. & Scholes, K. (1993) Exploring Corporate Strategy: London: Penticehall

Kelly J. R., M. S. P. G. D. (2003). Value Managing Projects in Construction. London, Blackwell Science.

Kitzenger, J. a. B., R.S. (1999). Developing Focus Group Research: Politics, Theory and Practice. London, SAGE.

Lincoln, Y. a. G., E. (1985). Naturalistic Enquiry. London, Sage Publications.

Lois, K. & Miles M.B. (1992) Improving the Urban High School: What Works and Why: London; Cassell

Lyons, M. (2003). Public Sector Relocation: Interim Report, H M Treasury; London

Lyons, M. (2004) Towards Better Management of Public Assets; H M Treasury; London

Male, S., et al. (2006). an OGC report "Improving Property Asset Management in the Central Civil Government Estate.

Male, S., Kelly, J., Fernie, S., Gronqvist, M. and Bowles, G., Ed. (1998). Value Management - The Value Management Benchmark: a good practice framework for clients and practitioners. London, Thomas Telford.

Maso, I. (2001). Phenomenology and Ethnography.

May, T. (1997). Social Research: Issues, Methods and Process. London, Open University Press.

McCracken, G. (1988). The Long Interview. Sage University Paper Series on Qualitative Research Methods. Beverly Hills, California, Sage. Vol. 13.

McGregor, W. a. T., Danny (1999). Facilities management and the business space. London, Arnold.

McMillan, J. H. S. S. (2001). Research in Education, A Conceptual Introduction. New York, Longman.

Mertens, Donna M. (2005) Research and evaluation in education and psychology : integrating diversity with quantitative, qualitative, and mixed methods; London : Sage Publications

Miles, M.B, and Huberman, A.M. (1994). *Qualitative Data Analysis*, 2nd Ed., Newbury Park, CA: Sage.

Miles, M.B., and Huberman, A.M. (1984). *Qualitative Data Analysis*, Newbury Park, CA: Sage.

Morgan, D. a. S., M. (1984). "Focus Groups: A New Tool for Qualitative Research." Qualitative Sociology Vol. 7: 253-269.

Morrish, I. (1976) Aspects of Educational Change: London: George Allen and Unwin Ltd

- Muther, R. a. H., L. (1979). Sytematic Planning of Industrial Facilities, Management and Industrial research Publications. 1 and 2
- NSWT (2004). Total Asset Management, New South Wales Government Treasury.
- Nutt, B. a. M., P. (2000). Facilities Management: Risks and Opportunities. Oxford, Blackell Science.
- Patton, M. Q. (1990). Qualitative Evaluation and Research Methods Newbury Park, CA, Sage Publications, Inc.
- Payne, S. a. B., D. (1997). Grounded Theory-Its Basis, Rationale and Procedures, The Falmer Press.
- Payne, T. (2000). Facilities Management: A Strategy for Success. Oxford, Chandos Publishing.
- Philips, L. (1988). The Economics of Imperfect Information. London, Cambridge Press.
- Postlethwaite, T. (Eds), The International Encyclopedia of Education. 2nd Edition, Kidlington, Oxford: Elsievia Science Ltd Vol 5
- Punch, K. F. (2000). Developing Effective research Proposal. London, SAGE.
- Robson, C. (1993). Real World Research: A Resource for Social Scientists and Practitioner Researchers. Oxford, Blackwell.
- Rondeau, B. L. (1995). Facilities Management. New York, John Willey & Sons Inc
- Rondinelli, D. A. et al (1990) Planning Educational Reforms in Developing Countries: Duke: University Press
- Rose, D. a. S., O. (1996). Introducing Data Analysis for Social Scientists. Buckingham, Open University Press.
- RTA (1996). RTA Infrastructure Maintenance Plan 1996-2001. N. S. W. Road Transport Authority, Australia, NSW Audit Office Seale, C. (1998). Qualitative Interviewing. Researching Society and Culture. C. Seale. London, Sage.
- SFEFC (2000). Estate Strategy Guidance, Scottish Further Education Funding Council.
- Seidman, I. E., () ; (1991). Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences. New York:.
- Silverman, D. (1985). "Qualitative Methodology". London:, Gower Press.
- Smircich, L., Ed. (1983). Studying Organizations as Cultures. Beyond Method. London, Sage Publications.

- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
- Stephens, D. (1998). "Girls and Basic Education: A Cultural Enquiry." London, SAGE.
- Stoll, L. & Fink, D. (1996) Changing our Schools: Buckingham Philadelphia OUP
- Strauss, A. a. C., J. (1994). Basics of Qualitative Research: Grounded Theory Procedures and Techniques. London, Sage.
- Streubert, H. J & Carpenter, D. R (1999) – Qualitative Research in Nursing: advancing the humanistic imperative (2nd Ed), Philadelphia, Lippincott
- Stromquist, N. P. (1996) "Transforming Education and Training" in ILO (Ed) Gender, Education and Development: International Training Centre of the ILO; Turin (Italy)
- Stapleton, T. (1986). Estate Management Practice. Avon, The Bath Press
- Sturman, A. (1997). "'Case Study Methods" in Keeves." J. P (Ed) Educational
- Styles, M. D. G. (2000). Best value Advanced Asset Management - An Australian Perspective. Innovation in Urban Infrastructure, Louisville, APWA International Public Works Conference
- TAC. (19997). "Pavement Design and Management Guide." at www.tac-atc.ca.
- Takim, R and Akintoye, A (2002) Performance indicators for successful construction project performance. In: Greenwood, D (Ed.), 18th Annual ARCOM Conference, 2-4 September 2002, University of Northumbria. Association of Researchers in Construction Management,
- Teicholz, E., Noferi, C and Thomas, G. (2005). "Real Property Asset Management." Facilitie Management Journal.
- Timo, N. (1997). Key Performance indicators in Enterprise Bargaining: A guide for Managers and Employee representative. Good Employment Practice series. North Ryde, NSW, CCH Australia Ltd
- Then, D. (1997). "Property as an Enabling Resource to Business - Real Estate Management." 2006, from www.rics.org/NR.
- UNDP (2005). Human Development Report. Washington, United Nations.
- UTAS. (2005). "Strategic Asset Management Plan." at www.utas.edu.ac
- Varcoe, B. J. (1996). "Business-Driven Facilities Benchmarking." Facilities 14(3/4)
- Vicroads (1998). Victorian Local Government infrastructure Study, The Victoria Government, Australia

Vulliamy, G., Lewin, K., & Stephens, D (1990). Doing Educational Research in Developing Countries. London, Falmer.

Wadley, D. (2004). *Social Welfare and Urban Design: Advancing Planning and Development through Visual Prominence Assessment*. Brisbane, University of Queensland.

Warwick, D. P. et al, (1992) "The Implementation of Education Innovations: Lessons From Pakistan". International Journal of Educational Development, Vol 12, No 4

Warwick, D.P. , Reimers, F. & McGinn, N. (1991) "The Implementation of Educational Innovations: Lessons From Pakistan" International Journal of Educational Development. Vol12, No 2

Webster, M. (1985). *Webster's Ninth New Collegiate Dictionary*. London, Meriam - Webster Inc.

West, M. & Ainscow, M. Managing School Development: A Practical Guide: London: Fulton Publishers

Whitaker, P. (1993) Managing Change in Schools: Buckingham Philadelphia OUP

Woodhouse, J. (2001). "Asset Management." Asset Management Process and Tools, at www.iam-uk.org.

Yin, R. (1984). *Case study research: Design and methods* (1st ed.). Beverly Hills, CA: Sage Publishing.

Yin, R. (1989). *Case study research: Design and methods* (Rev. ed.). Newbury Park, CA: Sage Publishing.

Yin, R. (1993). *Applications of case study research*. Newbury Park, CA: Sage Publishing.

Yin, R. K. (1994). *Case Study Research: Design and Methods*. London, SAGE.

APPENDIX A

CATEGORIZATION OF FEDERAL COLLEGES OF EDUCATION

a) Categorization of Colleges according to geo-political zone

Zone 1- The Northern Region

1. Federal College of Education, Bichi, Kano State
2. Federal College of Education, Gombe, Gombe State
3. Federal College of Education, Gusau, Zamfara state
4. Federal College of Education, Kano, Kano State
5. Federal College of Education, Katsina, Katsina State
6. Federal college of Education, Kontagora, Niger State
7. Federal College of Education, Okene, Kogi State
8. Federal College of Education, Pankshin, Plateau State
9. Federal College of Education, Potiskum, Yobe State
10. Federal College of Education, Yola, Adamawa State
11. Federal College of Education, Zaria, Kaduna State

Zone 2 – The Southeastern Region

1. Federal College of Education, Asaba, Delta State
2. Federal College of Education, Eha-Amufu, Enugu State
3. Federal College of Education, Obudu, Cross River State
4. Federal College of Education, Omoku, Rivers State
5. Federal College of Education, Umunze, Anambra State

Zone 3 – The Southwestern Region

1. Federal College of Education, Abeokuta, Ogun State
2. Federal College of Education, Akoka, Lagos State
3. Federal College of Education, Oyo, Oyo State
4. Adeyemi College of Education, Ondo, Ondo State

b) Categorization of Colleges according size (student population)

Category I (Large): Colleges with Student population above 8000

1. Federal College of Education, Akoka
2. Federal College of Education, Asaba
3. Federal College of Education, Kano
4. Federal College of Education, Oyo
5. Federal College of Education, Zaria

Category II (Medium): Colleges with Student population of 600-8000

1. Federal College of Education, Gombe
2. Federal College of Education Kontagora
3. Federal College of Education, Obudu
4. Federal College of Education, Okene
5. Federal College of Education, Omoku
6. Federal College of Education, Pankshin
7. Federal College of Education, Yola

Category III (Small): Colleges with Student population below 6000

1. Federal College of Education, Abeokuta
2. Federal College of Education, Bichi
3. Federal College of Education, Eha-Amufu
4. Federal College of Education, Katsina
5. Adeyemi College of Education, Ondo
6. Federal College of Education, Potiskum
7. Federal College of Education, Umunze

APPENDIX B

The RICS Building Maintenance Definitions

The field study applied RICS building maintenance definitions in assessing conditions of buildings as given below:

A - *As new condition.*

Features one or more of the following: Typically built within the last 5 years, or may have undergone a major refurbishment within this period. Maintained / serviced to ensure fabric and building services replicate conditions at installation. No structural, building envelope, building services or statutory compliance issues apparent. No impacts upon operation of the building.

B - *Sound, operationally safe and exhibiting only minor deterioration.*

Typically features one or more of the following: Maintenance will have been carried out. Minor deterioration to internal/external finishes. Few structural, building envelopes, building services or statutory compliance issues apparent. Likely to have minor impacts upon the operation of the building.

C - *Operational, but major repair or replacement needed in the short to medium term (3 years).*

Typically features one or more of the following: Requiring replacement of building elements or services elements in the short to medium term. Several structural, building envelope, building services or statutory compliance issues apparent, or one particularly significant issue apparent. Often including identified problems with building envelope (windows / roof etc.), building services. Likely to have major impacts upon the operation of the building, but still allow it to be operable.

D - *Inoperable or serious risk of major failure or breakdown.*

Building is inoperable, or likely to become inoperable, due to statutory compliance issues or condition representing a health and safety risk or breach. May be structural, building envelope, or building services problems coupled with compliance issues. The conditions are expected to curtail operations within the building. Exclude very minor items which can be rectified easily.

Fitness for purpose

This is an assessment of how effective each building is, in supporting its service delivery requirements. It has been carried out through the triangulation of document analysis, physical observation and interviews, using four categories from good to poor. Factors considered in the assessment include: room sizes, location, furniture, environment, fittings and equipment.

The categories are:

A – Good fit: the floor of the building or building fully supports current functions. There are no negative functions taking place. (The space is highly suitable for current functions)

B – Above average: the floor of the building or building provides a good environment for current function in all or most respects. There may be shortfalls in certain areas but these have only a minor effect upon current functions. (The space is suitable for current functions)

C – Below average: the floor of building or building has provides a reasonable environment for current function in many respects but has a number of short falls. These shortfalls may be causing mismatches between space and function that is having a more significant effect upon functions than grade B room. (The space is generally unsuitable for current functions)

D – Poor: the floor of the building or building fails to support current function and is unsuitable for current use. The operational problems associated with such space are major and are constraining current functions in the space. Space in this category may require alternative solutions, rather than straight forward improvements in particular feature of the space. (The space is very unsuitable for current function)

APPENDIX C

Coding and Categorization of Data during Data Analysis

Categorization of Themes

Data from all sources were initially categorized into ten sub-themes as follows:

- A – Stakeholder needs/service delivery objective;**
- B- Academic plans/student and staff population;**
- C –Assets own/rented and condition of assets and facilities;**
- D – FM services and infrastructure;**
- E – Current/projected requirements of assets and facilities;**
- F – Funding/capital and recurrent expenditure;**
- G – Capital investment/ maintenance plans;**
- H – NCCE/Government policies and guidelines;**
- I – Information/management system and human resources;**
- J – Problems, opportunities & options**

Then a further categorization under the following headings:

- 1 – Corporate goals/service delivery requirements;**
- 2 – Existing assets and facilities;**
- 3 – Gaps between existing and required facilities;**
- 4 – Problems opportunities and appraisals; and**
- 5 – Strategic choice and implementation**

APPENDIX D

List of Documents Examined and Factors Considered in Physical Observation

A. Documents Examined

- Decree establishing the college
- College corporate goals, mission statement and academic plan
- Current and projected student and staff population
- Development plan
- Management structure of estate department
- Budget plans
- Central time table
- Government policy on asset procurement, maintenance and disposal
- Maps, building plans and photographs
- Estate terrier (schedule of all properties)
- Information on tenure of buildings
- Maintenance plan
- Building use and floor space schedules
- Valuation, leases and insurance information
- Major works programme
- FM contracts
- Local revenue generation plans
- Environmental policies, transport and parking policies
- Running cost
- Estate department staff development plans

B. Factors Considered during Physical Inspection of Assets/Facilities

- Number and age of assets
- Physical condition of assets – new or as new; sound operationally safe, exhibiting only minor deterioration; operational, but minor replacement needed soon; inoperable or serious risk of failure or breakdown
- Capacity of assets
- Functionality of assets – fitness for purpose
- Space utilization
- Availability and functionality of Telecommunication and IT facilities
- Functionality of infrastructural facilities

APPENDIX E

List of Interview Respondents in each College studied and Interview Questions

Interview Respondents

40 respondents interviewed. This number was made up of:

- 5 principal officers – the Provost, Director of Estate, Bursar, Registrar and the Librarian
- five officials of the estate department
- Ten officials of staff associations
- Five individual academic staff
- Five non academic staff
- Ten officials of student union

Interview Questions

The following questions, among others, featured during the interviews:

- What are the corporate college goals and objectives?
- What are the assets and facilities needs that can effectively support these goals?
- To what extent are the existing assets and facilities adequate in meeting service delivery requirement of the college?
- What factors are responsible for inadequacy/poor state of assets and facilities and what could be done to remedy the situation?
- What are the levels of service expected of the assets and facilities?
- What is the source (s) of power and water supply and how efficient?
- Does the college consider non-asset options in meeting its service delivery needs?
- What factors are responsible for the inadequacy of assets in meeting service delivery requirements?
- Does the college have comprehensive, accessible and reliable asset data base?
- Does the college have a reliable process of determining asset condition, and performance?
- How do you rate budget implementation in respect of development and maintenance of physical facilities?
- How adequate is the government funding for assets and facilities expenditures and how does the college augment shortfalls?
- What method of valuation is used and how appropriate?
- How are space needs assessed and how is space allocated and managed?
- How suitable and functional are the assets to deliver the required service?
- How is maintenance coordinated and implemented?
- How are maintenance requests logged, prioritized and what is the response rate?
- What is the asset disposal policy of the college?
- What strategies can be developed to ensure the adequacy, effectiveness and efficiency of assets and service in meeting service delivery requirements?
- How effective is the staff development programme of the college?
- How does the college identify all potential income-earning opportunities from assets and facilities and how does the college set student rents
- How effective is the coordination and monitoring of asset development and maintenance by the NCCE?

APPENDIX F

Sample of Summarized Interview and Scripts

Main points from the interview with the Provost of 1st case Study College

Interview text	Theme Category
<ul style="list-style-type: none"> ➤ The strategic objectives of the college, details of which you can obtain from the documents made available, includes <ul style="list-style-type: none"> - production of highly efficient and motivated teachers - Preparation of college for upgrade to Degree awarding institution 	A
<ul style="list-style-type: none"> ➤ We have 20 or so academic departments running programmes leading the award of the Nigerian Certificate of Education, NCE. We also have over six thousand students and hope to considerably increase these figures in the near future. 	B
<ul style="list-style-type: none"> ➤ There is a Government requirement regarding student enrolment in the ratio of 60:40 in favour of Science. Presently we have more students in the Arts based courses but are trying hard to meet the target 	B
<ul style="list-style-type: none"> ➤ Existing assets and facilities are inadequate to meet current and future demands 	C
<ul style="list-style-type: none"> ➤ Existing assets and facilities are largely unsuitable for effective and efficient service delivery 	C
<ul style="list-style-type: none"> ➤ College cannot afford to adhere to the NCCE standards regarding space utilisation because of insufficient space 	C, H, J
<ul style="list-style-type: none"> ➤ Academic development committee is responsible for space allocation. Very few spaces are centrally controlled 	D, I, J
<ul style="list-style-type: none"> ➤ Insufficient funding and years of neglect by successive Government is responsible for inadequate and poor state of assets and facilities 	C
<ul style="list-style-type: none"> ➤ Immediate non asset solutions to service delivery problems is the extension of lecture hours 	J
<ul style="list-style-type: none"> ➤ No formal collaborative arrangement with other organisations for use of assets 	J
<ul style="list-style-type: none"> ➤ Sports facilities are currently inadequate and not very much in good condition 	C
<ul style="list-style-type: none"> ➤ Presently, the college does not have a comprehensive, accessible and reliable asset data base, however experts have been commissioned to study and prepare such data base. 	I
<ul style="list-style-type: none"> ➤ We only rely on NCCE guidelines for example on space utilisation to assess asset performance. Assets and facilities users are required to report to works department failures and maintenance requirements 	G, H
<ul style="list-style-type: none"> ➤ We normally prepare annual capital investment and maintenance budgets in accordance with some laid down guidelines and submit to the Government through NCCE. Implementation however depends on the funding we get from the Government. We usually get only a fraction of what is budgeted and approved. 	F, G
<ul style="list-style-type: none"> ➤ We try to augment funding shortfalls through local revenue generation, but that is not enough, we are currently reaching out to some donor agencies and individuals, particularly, members of our Alumni Association, to come to our aid 	F, J
<ul style="list-style-type: none"> ➤ We are supposed to conduct valuation of assets every year but to financial constraints we are not able to do that. Only selected assets are valued for purpose of insurance, and even that is not done annually 	C
<ul style="list-style-type: none"> ➤ The Governing Council is vested with the responsibility of determining 	C

how college assets are disposed of. So far the college has never disposed of any fixed assets.	
➤ The most critical factor that can help ensure adequacy, effectiveness and efficiency of college assets is funding. Without sufficient fund, we may not be able to realise our goals as far as provision of these facilities are concerned. The Governing Council has just been inaugurated and we hope to put heads together and find lasting solutions to this funding problem.	F, J
➤ We also need to design a robust capacity building programme for the Works department staff in order to prepare them for the challenges of ensuring that our physical facilities are managed optimally	I, J
➤ Most of our FM services are currently provided in-house. However we are discussing the possibilities of outsourcing some services such as security, gardening and so on, but there are a lot of political as well as social problems that we first of all have to address.	D, J
➤ Outsourcing services that are currently done in-house will entail retrenching some staff and this can generate lots of problems, so we are very careful.	D, J
➤ Public utility services in this country, as you are aware, is very poor. Sometimes we can be without such services for days or even weeks. The college therefore has to source its electricity and water supplies locally and at a very heavy financial cost. This is a very big problem, especially given the fact that funding from the Government is very much inadequate.	D, J
➤ We are trying to negotiate with NEPA (power utility Company) for improved services but there is no much hope for success because I think their problems has much to do with capacity.	D, J
➤ In our renewed efforts to locally generate more funds, we are now shifting emphasis from students' registration charges to commercial activities in the campus. We are also thinking of raising charges for use of college facilities by outsiders. A committee has been set up under chairmanship of the Bursar to study ways of improving our local revenue base.	F, J
➤ NCCE has been discharging its statutory responsibilities in the college in most satisfactory manner. They provide accreditation for our academic programmes and monitor execution of capital projects to ensure compliance with standards. They also give guidelines and standards for development, maintenance and operation of our facilities	H

Main points from the Interview with the Registrar of the 2nd Case Study College

➤ You go through our documents to see what exactly the college strategic objectives are. But basically we aim at producing qualitative teachers for the primary and junior secondary schools. We also hope to attain the status of a degree awarding institution in the near future.	A
➤ Our current student enrolment is around 8000, we hope to raise this figure to 12000, by the year 2010, if we get funds to expand our physical facilities.	B
➤ Government directive on student enrolment is in the ratio of 60:40 for science and Arts based courses. At present we have more arts students, but we are gradually trying to reverse the situation, to comply with Government directives. The Laboratories however needs to be upgraded if we are to meet the target. Students also need to be encouraged to study science courses.	B
➤ We have at the moment a total of 25 academic departments and plans to introduce about six new academic programmes in the next five years.	B

	This is in line with Government objectives of having qualified teachers in all subjects.	
➤	Our needs in terms of assets and facilities are numerous and details can be obtained from Works department. But basically, we need classrooms, lecture halls, laboratories, student hostels, staff houses, and so on. I should also add that we need a befitting central library. The facilities on ground at the moment are inadequate and also some are unsuitable for the services they are expected to provide.	A, E, C
➤	We have a committee with membership comprising staff from academic departments, works and the Registry, who work out space requirements and allocate space according to needs and availability.	C, I
➤	The college has not been conducting space utilisation survey, but we know that almost all academic space is being over utilised due to inadequacy of facilities on one hand and ever increasing student enrolment, on the other hand.	C, I
➤	The space problems can only be addressed if additional buildings are provided and existing ones properly maintained. However all these boils down to one thing and that is funds, which unfortunately we have not been receiving enough	F, J
➤	The only non asset solution we are able to initiate is the extension of lecture hours which now run to 8.00pm in some departments. This arrangement is not without its costs as we have to pay staff over time and also ensure that the generator is run if NEPA is off.	J
➤	Because we are located in a relatively small town, it is difficult to have some kind of collaborative arrangement with other organisations for use of facilities. In fact the our community here rely heavily on some of our facilities for their social activities. For example they rely on our sports facilities and also lecture halls for meetings and other social gatherings. All these are provided free of charge.	J
➤	Our sport facilities are best in town, but certainly do not meet standards, both in terms of numbers and their conditions. A lot need to be done to improve these facilities in order to meet the high demand.	C
➤	Many factors are responsible for the inadequacy and poor state of our physical facilities. The principal factor, of course is lack of sufficient funds with which to improve these facilities. This made worse by the sharp increase in student enrolment, occasioned by very high demand	F, J
➤	Data on college assets and facilities at the moment is very scanty. We are however planning to establish a comprehensive and reliable data as recommended by the NCCE	I
➤	Generally, budget in the college is hardly implemented as proposed and approved due to our inability to get funds. This therefore adversely affects maintenance of our physical facilities	F
➤	To ensure adequacy, effectiveness and efficiency of our assets, we need improvement of our financial base. At the moment we rely heavily on Government grant which hardly meet our requirements. It is therefore necessary to device other means of getting money and we are planning to go commercial with some of our facilities. The staff of estate also needs some form of capacity building for them to meet the challenges	F, I

Main points from the Interview with the Registrar of the 2nd Case Study College

APPENDIX G

Purpose & Summary of Discussions at Interactive Verification Workshops

The verification workshops were intended to draw together participants from within each case study college. Each was attended by approximately fourteen participants, including the interviewees as well as other stakeholders who wished to contribute to the study.

The group discussion approach was chosen to meet specific requirements:

- To further sensitise stakeholders on the need to develop strategic plan that would ensure effective and efficient management of college assets and facilities
- To feedback preliminary findings and verify the researcher's understanding of the problems of assets and facilities in meeting service delivery objectives within each college.
- To help clearly identify inadequacies in the current practice from the stakeholders' viewpoint.
- To allow for an interactive exchange of information and minimise unintentional bias by the researcher.
- To benefit practitioners/participants by enabling them to share ideas and experience.
- To explain the reason for key problem areas and generate ideas as to how they can be overcome within the framework based on the knowledge and experience of participants.
- To strengthen and confirm the interim asset strategy model

To fulfil these specific requirements open-ended questions were used to allow participants to determine the direction of the response. The questions were designed to evoke group discussions and explore the various dimensions of an issue, and not to arrive at a solution. Examples of questions that have been used in the feedback workshops are shown in table AG-1.

- | |
|--|
| <ul style="list-style-type: none">• What are the main service delivery requirements of college assets?• How accurate is the interim report on college assets/facilities?• What factors and additional information that needs to be included?• What are the expectations of stakeholders?• How can the interim asset strategy model be improved upon? |
|--|

Table AG-1 Examples of Questions used in the Field Study Feedback Workshops

The investigation at the feedback workshops resulted in a number of common issues that kept recurring in all workshops. These issues were mainly focused on the increasing student enrolment in the face of inadequate physical facilities and dwindling revenues. These had helped to shape and contextualize the asset strategy model.

The workshop identified a number of factors that contributed to the inadequacy and poor condition of college assets. These include poor funding, sharp rise in student enrolment without corresponding expansion of physical assets, insufficient maintenance budgets and lack of properly structured assets policy. The workshop also discussed the poor state of public utilities and the high cost of generation of power and provision of water locally. Suggestions were then made on how to address these important issues. After an exhaustive deliberation, the workshop adopted the interim report and the interim asset strategy model

Table AG-2 Summary of Results from Feedback Workshop at the 1st main study college

The second case study college was going through similar challenges as the pilot and first case study colleges. The workshop was therefore focused on the inadequacies in the current practice in asset management and needs for the new approach. A number of issues evolved from the discussion which included need to improve IT facilities, classroom and laboratory accommodation, student and staff residences and local revenue generation. The interim strategy model was examined and adopted as model that if used by the college is capable of addressing problems associated with asset needs.

Table AG-3 Summary of Results from Feedback Workshop at 2nd Case Study College

The third case study college also faces similar challenges as the previous colleges studied. They range from inadequate accommodation, old and dilapidated buildings, unsuitable buildings, erratic power supply, poor funding, to issues relating capacity building for estate staff, improvement of sports facilities, collaborative arrangements with other organizations and improvement of local revenue generation. On the interim model, participants expressed satisfaction and noted its potential to bring about improvement in the effective and efficient management of assets and facilities in the college.

Table AG-4 Summary of Results from Feedback Workshop the 3rd Case Study College

APPENDIX H

Sample Analysis of Buildings and other Physical Facilities in one of the Colleges

Academic/Admin Buildings

Under both condition and fitness for purpose, factors considered are grouped into three and each graded on the score 1 – 4, with 4 representing very good and 1 representing poor.

Total score for each property is then graded as given in the table below.

A broad physical assessment of space utilisation for each property is represented by

- O – for over crowding; and
- U – for under utilisation

Scoring of condition and Fitness for purpose based on RICS Building Maintenance Definitions

Score	Grade	Condition	Definition
10 - 12	A	As New	Fitness for purpose Good fit: the floor of the building or building fully supports current function
7 - 9	B	Sound, operationally safe, exhibiting only minor deterioration	Above average: the floor of building or building provides a good environment for current function in almost all respect
5 - 6	C	Operational but major repair or replacement needed	Below average: the floor of building or building provides a reasonable environment for current functions in many respect but has a number of shortfalls
< 5	D	In operable or serious risk of failure or breakdown	Poor: the floor of building or building fails to support current function and is unsuitable for current use.

Table AH-1 Scoring of Fitness for Purpose

S/No	Facility	Use	Dimension (m ²)	No of Offices/rooms	No of Halls/studios	Condition					Fitness for Purpose					Space Utilisation	Remarks
						Build	Build ing	Statu	Total	Grading	Build	Build ing	Statu	Total	Grading		
School of Education																	
1	Block 1	Staff offices	519.84	10		2	3	2	7	B	2	3	2	7	B	O	Classrooms were partitioned to create staff offices in 1998
2	Block 2	Teaching	519.841	2	1 Lect Halls	2	3	2	7	B	3	2	2	7	B	O	One classroom converted to staff offices in 1996
3	Block 3	Teaching	519.84.1	-	2 classrooms 1 lecture hall	1	2	2	5	C	2	2	2	6	C	O	Visible wall cracks, urgent attention required
4	Block 4	Teaching	519.84	-	4 classrooms	3	3	2	8	B	3	2	3	8	B	O	Major rehabilitation work carried out on the building in 1998
5	Block 5	Teaching	519.84	2	2 Lect. halls	3	2	2	7	B	3	2	2	7	B	O	Major rehabilitation work carried out on the building in 1998
6	Block 6	Staff Offices	519.84	6		2	1	2	5	C	2	2	1	5	C	O	Building needs major maintenance work
7	Block 7	Staff Offices		-	1 Committee room												
School of Arts and Social Sciences																	
8	Block 1	Staff offices	519.84	8		2	2	2	6	C	1	2	2	5	C	O	
9	Block K	Teaching	519.84	-	4 classroom	3	3	2	8	B	2	2	2	6	C	O	Two class rooms converted to staff offices in 2001
10	Block 2	Teaching	519.84	2	2 Lect. Hall	2	1	2	5	C	2	2	2	6	C	O	
11	Block 3	Teaching	519.84.1	-	2 Lect Halls	2	2	2	6	C	2	2	2	6	C	O	Academic staff offices only
13	Block 4	Social Studies Centre	608.76	4	2 studios	2	1	2	5	C	2	1	2	5	C	O	
School of Languages																	
14	Block 1	Staff Offices	608.76	10		2	1	2	5	C	2	2	1	5	C	O	
15	Block 2	Teaching	608.76	2	4 classrooms	1	2	1	4	D	1	1	2	4	D	O	Major maintenance work required
16	Block 3	Language Lab	608.76	1	1 Lang. Lab 1 Auditorium	3	3	2	8	B	3	3	2	8	B	U	Auditorium used only occasionally
17	Block 4	Teaching	519.84	-	2 Lect Halls	2	2	2	6	C	2	2	2	6	C	U	Stores grossly under utilised

18	Block 5	Teaching	519.84	4	3 classrooms	2	2	2	2	2	2	1	2	5	C	U	One classroom converted to staff offices
19	Block 6	Teaching	519.84	2	2 Class rooms	2	2	2	2	6	C	2	6	6	C	O	Lab size too small for student numbers
20	Block 7	Teaching	519.84	2	2 Classrooms	2	2	2	2	6	C	2	2	5	C	O	Lab size too small for student numbers
D	School of Sciences																
21	Block 1	Staff Offices	519.84	12	-	2	2	2	2	6	C	2	2	6	C	O	Academic staff offices only
22	Block 2	Teaching	608.76	2	4 Classrooms	2	2	2	2	6	C	2	3	8	C	U	Committee room not frequently used
23	Block 3	Teaching	608.76	-	2 Lect Halls	2	2	2	2	6	C	2	2	6	C	O	
24	Block 4	Experiments	608.76	2	2 Labs	2	3	2	2	7	B	2	3	7	B	O	
25	Block 5	Experiments	608.76	2	2 Labs	3	3	3	3	9	B	3	4	9	B	U	Conference room under utilised
E	School of Vocational Sciences																
26	Block 1	Staff Offices	210.00	10	-	2	1	1	1	4	D	2	1	4	D	U	Major maintenance work required
27	Block 2	Teaching	519.84	-	4 Classrooms	3	3	3	3	9	B	2	2	6	C	O	Renovated in 2003
28	Block 3	Teaching		10	2 Lect halls	4	3	3	3	10	A	4	3	10	A	O	Newly constructed
29	Block 4	Experiments		2	2 Typing Studios, 1 Agric Lab	4	3	3	3	10	A	3	4	10	A	O	New building. Constructed in 2001
30	Block 5	Teaching and Experiments		-	2 Fine Arts Studios 1 Lect Hall	4	3	3	3	10	A	3	3	9	B	O	New building, commissioned in march 2005
31	II	Teaching and Experiments		2	2 Home Economics Labs	4	3	3	3	10	A	3	3	9	B	O	New building, constructed in 2002
F	Administrative Buildings																
32	Block 1	Office of the Provost		8	1 Conference Hall	2	2	2	2	6	C	2	1	4	D	O	
33	Block 2	Registry Department		17	1 Committee room												
34	Block 3	Bursary and Works Departments		10	1 Workshop												
G	Central Facilities																
35	Block 1	Central Library		8	3 Library Halls												
36	Block 2	Lecture Theatre 1		2	1 Lect Theatre												
37	Block 3	Lecture Theatre 2		2	1 Lect Theatre												
38	Block 4	Refectory and Union Building		6	4 Halls, 1 Kitchen												
39	Block 5	Gymnasium		1	1 Sports Hall												
40	Block 6	Central store		2	2 halls												
41	Block 7	Sick Bay		6	2 Halls												

Table AII-2 Summary of Building Condition and Fitness for Purpose for one of the Case Study Colleges

Student Hostels

S/No	Hostel Name	Occupancy	Dimension (m)	No of rooms	Condition				Fitness for Purpose				Remarks		
					Building fabric	Building services	Statutory compliance	Total Score	Grading	environment	furniture	Fittings and Equipment		Total Score	Grading
1	Aisha Hall	Female		32	3	2	2	7	B	2	2	2	6	C	Renovated in 2001
2	Elizabeth	Female		32	2	1	2	5	C	2	1	1	4	D	
3	Lami Tukur	Female		32	3	2	2	7	B	2	1	1	4	D	Major rehabilitation work carried out in 2002
4	Fatima Hall			32	1	2	2	5	C	1	1	2	4	D	Major repairs needed
5	Rashida Hall	Female		48	2	2	2	6	C	2	2	2	6	C	
6	Joy Davies	Female		48	2	2	2	6	C	2	2	2	6	C	
7	Maris Hall	Female		48	3	2	3	8	B	3	2	2	7	B	
8	Patricia Hall	Female		24	4	3	3	10	A	3	2	2	7	B	In good condition, recently renovated
9	Ahmed Hall	Male Hostel		48	3	2	2	7	B	2	1	2	5	C	
10	Umar Hall	Male Hostel		48	2	2	2	6	C	2	2	1	5	C	
11	Gidado Hall	Male Hostel		24	4	3	3	10	A	3	2	3	8	B	Newly renovated and in very good shape
12	Eagle Hall	Male Hostel		32	2	2	1	5	C	2	1	1	4	D	
13	Taylor Hall	Female Hostel		16	4	3	3	10	A	3	2	2	7	B	
14	Bayero Hall			32											

Table AII-3 Summary of Condition and Fitness for Purpose for one of the Case Study Colleges

Sports facilities

S/No	Facility	Numbers available	Condition	Remarks
1	8-Lane Athletics track	1	average	Requires grassing and re-marking of track lanes
2	Soccer Pitch	3	average	Perhaps the best pitch in town but re-grassed and properly maintained
3	Hockey Pitch	2	average	Lines needs to be properly defined
4	Basketball court	2	Poor - cracks on floors and broken boards	The courts are becoming unsafe for use due to wide floor cracks and broken boards
5	Volleyball Court	2	Poor - noticeable potholes	Proper maintenance required
6	Handball Pitch	2	Poor - noticeable potholes	Proper maintenance required
7	Lawn Tennis Court	3	Good condition	Newly constructed
8	Gymnasium	1	Poor	Building fabric and services needs maintenance while facilities in the gym are poor

Table AII-4 Summary of Sports Facilities in one of the Case Study Colleges

APPENDIX I

Sample of Document Analysis for one of the Colleges

Documents to be Examined	What to look for	Availability	Remarks	Theme Category
<ul style="list-style-type: none"> - Decree establishing the college - Corporate goals and mission statement - Academic plan 	<ul style="list-style-type: none"> - Relevant points in corporate plan which influence assets and facilities - A guiding vision or statement which steer developments and proposals for the long term - targets, such as projected academic programmes & student numbers, statement about expected quality of teaching and research, - Numbers, to determine assets and facilities requirements 	Available	<ul style="list-style-type: none"> - provision of facilities for teaching and learning in Technology, Applied Science, social science, Arts, etc - Working towards attainment of degree awarding status - Strategic objectives as in attached 	A
<ul style="list-style-type: none"> - Current and projected student & staff population - Number of academic programs 	<ul style="list-style-type: none"> - Numbers, to determine assets and facilities requirements 	Available	<ul style="list-style-type: none"> - current student population – 6942, projected population – 8860 by 2010; - No of academic departments – 28; projection - 33 	B
<ul style="list-style-type: none"> - Central time table 	<ul style="list-style-type: none"> How optimally academic space is utilised in order to determine needs for rationalisation, remodelling or additional space 	Available	<ul style="list-style-type: none"> - central time table in operation but concerns only education courses which are offered by all students of the college 	E
<ul style="list-style-type: none"> - Budget plans - Running cost 	<ul style="list-style-type: none"> -How much is provided for development and maintenance of assets and facilities, to determine whether adequate or not to meet service delivery requirements of the college - How much is spent on utilities and FM services, to determine cost saving measures - Constraints faced by the college in implementing budgets 	Partially available	<ul style="list-style-type: none"> - Figurers on total budget and maintenance budget provided - Detailed budget not provided 	F, G, J
<ul style="list-style-type: none"> - Maps 	<ul style="list-style-type: none"> Where campuses and various building are located in order to facilitate easy access 	Available	<ul style="list-style-type: none"> - Maps used to locate facilities 	C
<ul style="list-style-type: none"> - Building plans & 	<ul style="list-style-type: none"> - Assets data: numbers, age, sizes, condition, 	Partially	<ul style="list-style-type: none"> - poorly kept asset Register available which provide 	C

<p>photographs</p> <ul style="list-style-type: none"> - Asset Register - Information on tenure of buildings 	<p>use, tenure, value, etc, to determine fitness for purpose, space utilisation, and adequacy of assets in meeting current and projected requirements. This will help in deciding on the need to retain, develop, remodel, rehabilitate, maintain or dispose of assets.</p> <ul style="list-style-type: none"> - the desired quality of buildings in terms of finishes, designs and space standards 	available	information on age, sizes, maintenance	
<ul style="list-style-type: none"> - Maintenance plan 	<ul style="list-style-type: none"> - Whether the plan is focused on ensuring that assets support planned delivery of service; any links between maintenance objectives and asset performance - Whether maintenance budgets are adequate - Identify if maintenance resources are used effectively and efficiently 	Not available	<ul style="list-style-type: none"> - Maintenance are carried out on ad-hock basis and as funds permit - Detail of utilisation of maintenance resources not provided 	-
<ul style="list-style-type: none"> - Valuation, lease & Insurance 	<p>Assets which have particularly high and low value and which may be appropriate to sell off or to retain and develop in-house. Also to consider opportunity cost of assets, particularly those with limited use.</p>	Not available	<ul style="list-style-type: none"> - experts have just been commissioned to undertake valuation of selected assets for purpose of insurance 	-
<ul style="list-style-type: none"> - Development plan 	<ul style="list-style-type: none"> - What assets and facilities the college plans to develop in order to meet its service delivery requirements and the likelihood of achievability. - Funding for planned projects; college grants or partnership with the private sector - whether development plan is consistent with corporate objectives and academic plan 	Partially available	<ul style="list-style-type: none"> - Some capital projects have been proposed for execution under in a five year development plan. These projects include expansion of the central library, construction of a new academic building complex, construction of hostel blocks and sports facilities. These have direct bearing to the college strategic objective. - Funding will be through Government grants except for the sports facilities where collaboration with state Government is being worked out 	F, G, J
<ul style="list-style-type: none"> - Management of estate department - Estate staff development plan 	<ul style="list-style-type: none"> - Number of staff, their qualifications, schedule of duties, skills and experiences, in order to assess their capabilities to handle the demands for service delivery - Type of training planned for the staff and how that relates to service delivery demands 	Partially available	<ul style="list-style-type: none"> - Details staff numbers, qualifications and schedule of duties are provided as attached. There is however no documented plans for training 	I, J

Table AI-1 Summary of Documents Analysed in one of the Case Study Colleges

APPENDIX J

Summary of Condition of Buildings in the Colleges Studied.

Age of buildings

Most of the buildings in the colleges were constructed between 1975 and 1978 after which there were virtually no further development until the period 1988-94, then 1995-2007. The distribution is shown in Fig AJ-1 below.

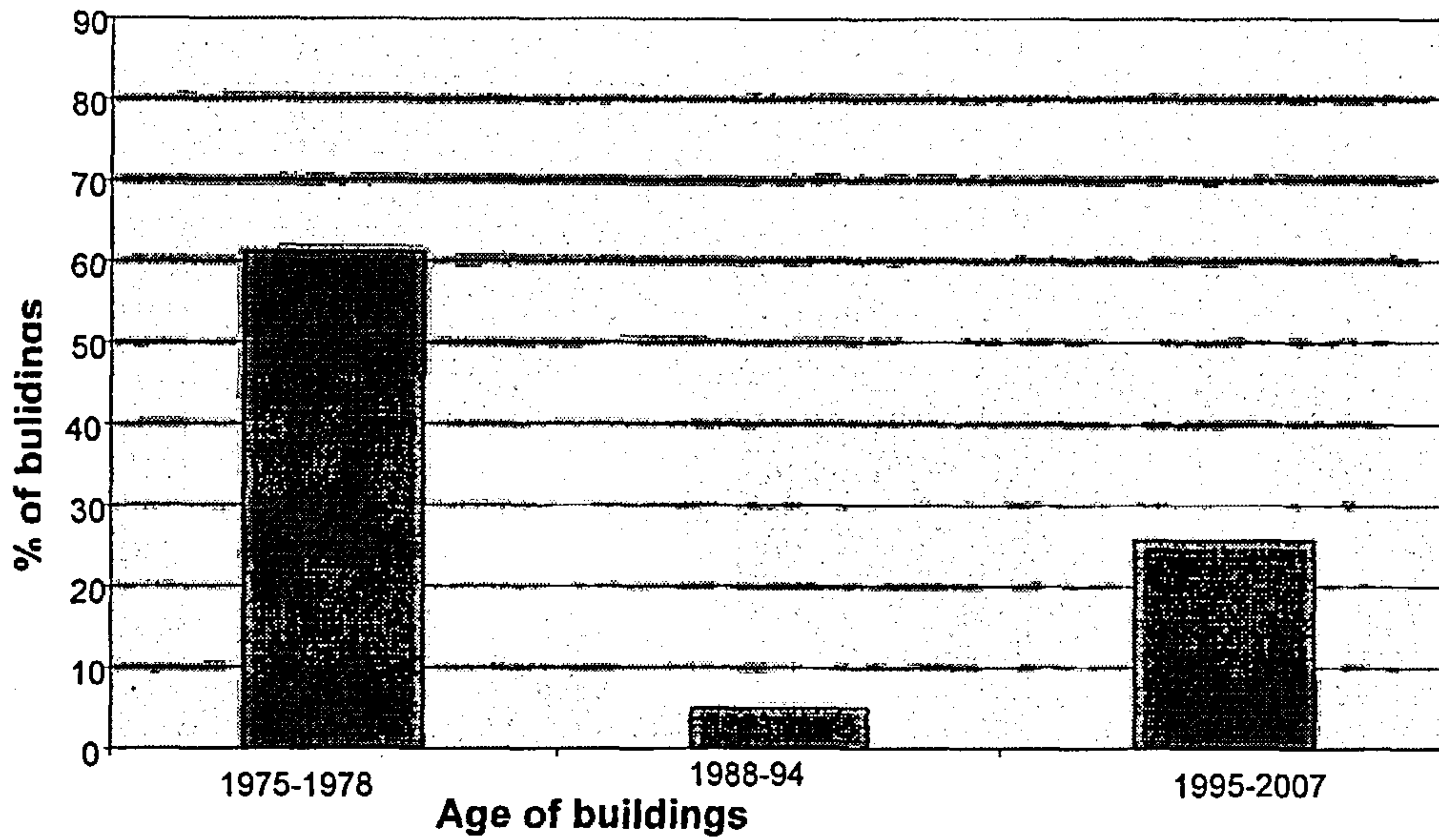


Fig AJ-1 Age of buildings

Condition of college properties

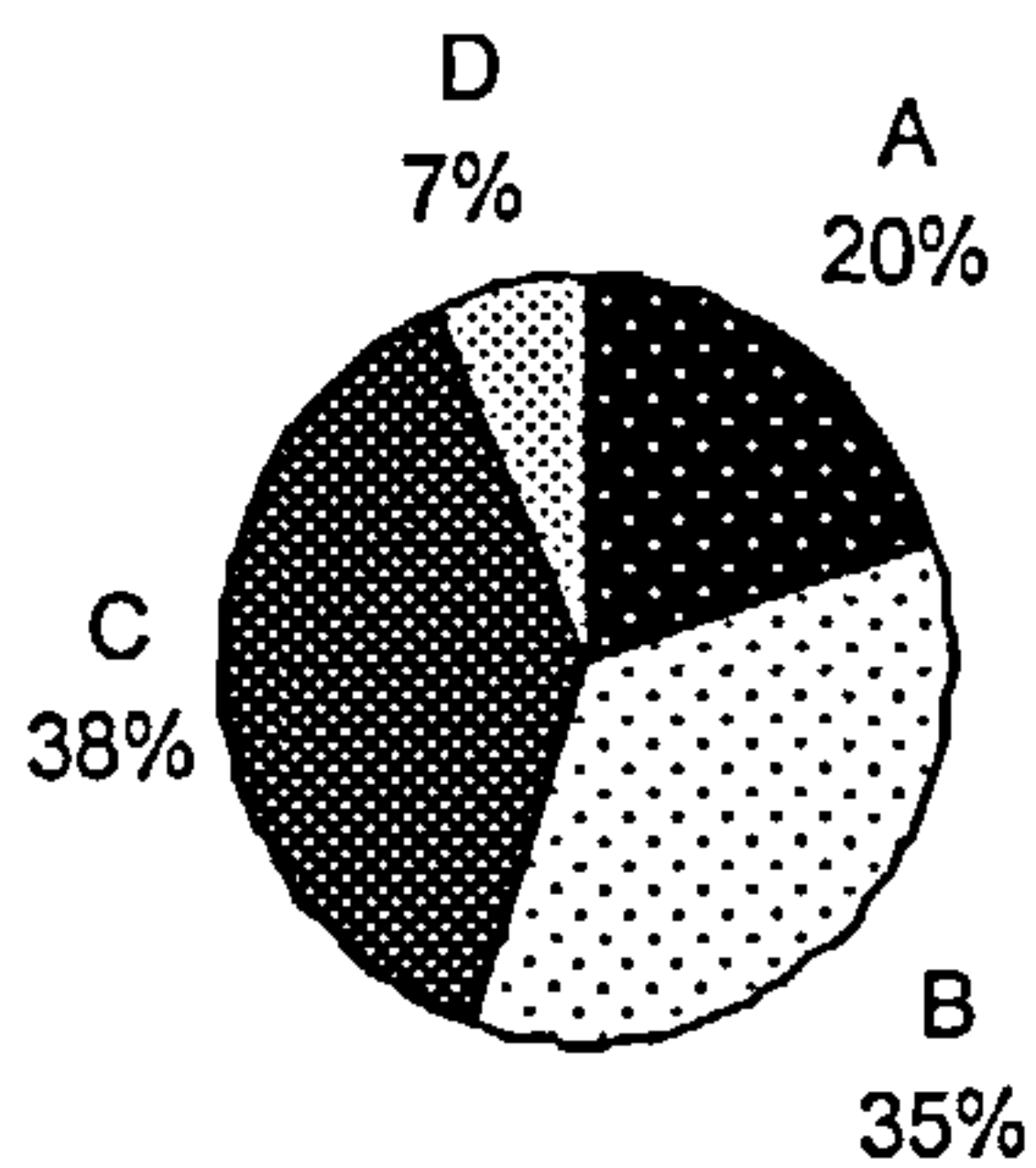


Fig AJ-2 condition of properties

Most of the properties of the colleges fall within categories C and D. Figure 3 below shows overall fitness for purpose of the college properties

Fitness for purpose of college buildings

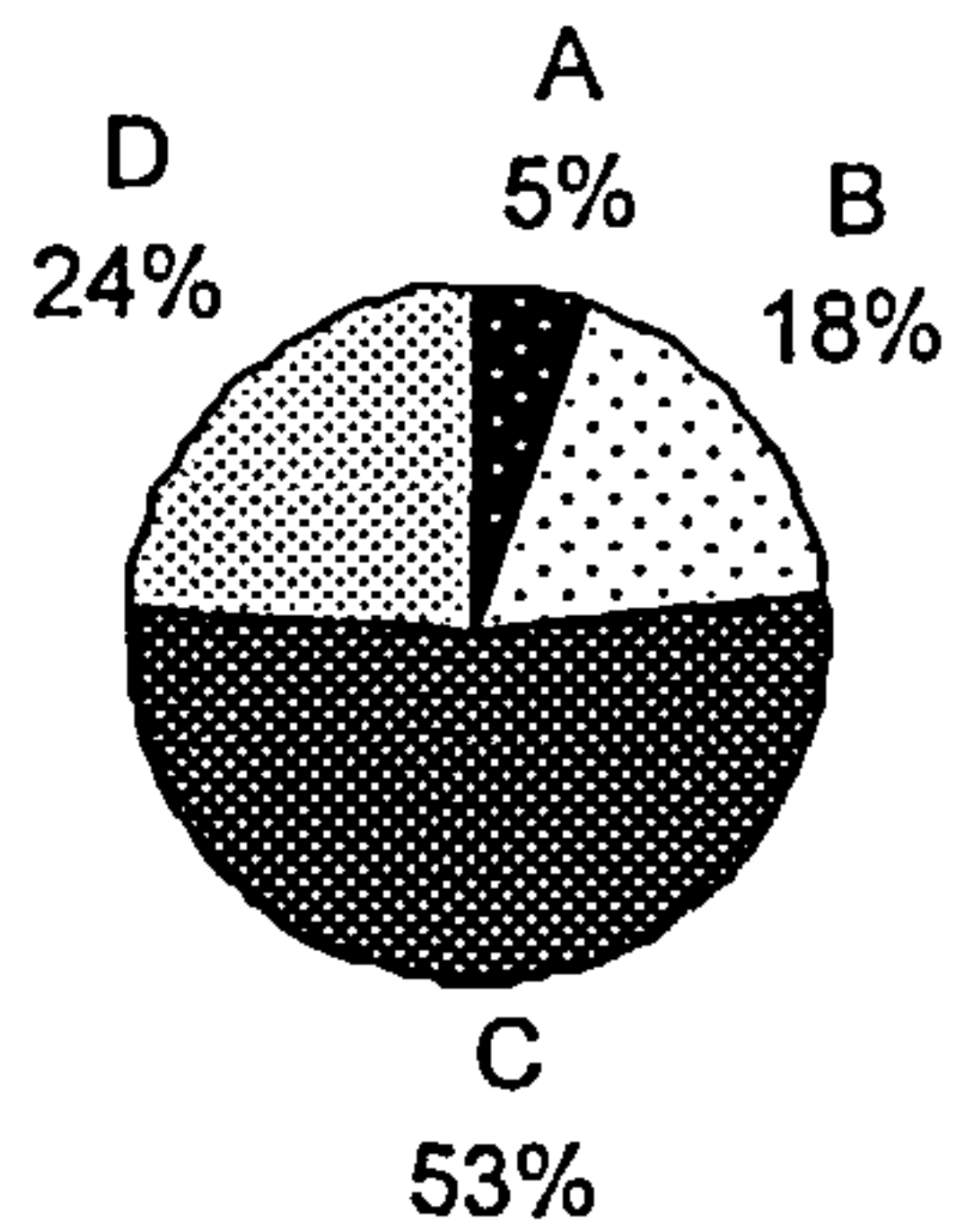


Fig AJ- 3 Fitness for purpose of buildings

APPENDIX K

Summary of Problems, Opportunities and Proposals identified at the Workshops

Problems	Opportunities	Proposals
Academic space <ul style="list-style-type: none"> insufficient classrooms/lecture halls to meet growing student population unsuitable classrooms/lecture halls insufficient/ill equipped labs inadequate maintenance of buildings shortage of office space too much space in some departments inadequate library 	<ul style="list-style-type: none"> develop additional academic facilities refurbish/remodel classrooms/laboratories improve maintenance budget revert some offices back to classrooms staff to share offices increase number of classrooms/lecture halls under central control adopt proactive maintenance strategies improve furniture expand central library collapse offices to create classrooms introduce non asset solutions 	<ul style="list-style-type: none"> construct new academic buildings introduce planned maintenance of building reorganise labs, classrooms and lecture halls to release space more staff to be made to share offices Some classrooms earlier partitioned to create offices be reverted back to classrooms broken furniture to be mended and additional ones provided to meet demand increase maintenance budget identify more lecture halls to be centrally managed Expansion of Libraries be vigorously pursued IT facilities be improved Introduce more part-time studies Review lecture time table to cover evenings and weekends
Administration space <ul style="list-style-type: none"> poor condition of building insufficient office accommodation inadequate furniture 	<ul style="list-style-type: none"> refurbish/remodel offices improve furnishing adopt office sharing provide additional offices build more office blocks convert more classrooms to offices 	<ul style="list-style-type: none"> refurbish/remodel and reorganise offices to release space repair bad furniture and provide additional ones staff be made to share offices propose construction of additional offices
Telecommunication and IT facilities <ul style="list-style-type: none"> poor telecommunication network inadequate IT facilities 	<ul style="list-style-type: none"> Upgrade existing internal communication system Provide additional external communication lines Incorporate open access to IT facilities in general teaching and administration space Increase IT workstations in the library 	<ul style="list-style-type: none"> Expand the intercom system and Procure more external lines Provide IT training to all staff upgrade IT facilities in the Libraries
Student residences <ul style="list-style-type: none"> insufficient student hostels poor condition of hostels over crowding of hostels demand for improved quality of hostels Very low rent 	<ul style="list-style-type: none"> Hand over management and maintenance of hostels to private investors Restructure the Student Affairs Department to improve management of student hostels Rehabilitate all student hostels Construct additional hostels Increase rents payable per bed space 	<ul style="list-style-type: none"> Existing hostels be handed over to private investors who will manage and properly maintain them, then charge appropriate rent Provide land to private investors to build new hostels under the BOOT partnership

<p>Sports facilities</p> <ul style="list-style-type: none"> • Insufficient sports facilities • Increasing demand for facilities • Poor condition of facilities 	<ul style="list-style-type: none"> • Upgrade existing facilities • Develop additional facilities • Charge appropriately for use of facilities, to fund necessary improvements • Restrict use of facilities to students and college staff only • Seek external funding for facilities 	<ul style="list-style-type: none"> • Refurbish existing facilities • Collaborate with State Sports council to construct additional facilities • Reorganise management of facilities and introduce appropriate charges for use
<p>Energy</p> <ul style="list-style-type: none"> • Poor public utilities services • Increasing cost of energy • Very high cost of providing own electricity and water 	<ul style="list-style-type: none"> • Reduce energy consumption by improvements to existing buildings and review specifications for new buildings to ensure sustainability • Provide additional power generators • Introduce power rationing between various units 	<ul style="list-style-type: none"> • Identify areas of high consumption and take appropriate measures • Renegotiate with utility providers for improved services • Curtail hours of local power generation • Solicit support from state government to sink additional boreholes and provide additional generators
<p>Administration of assets and facilities</p> <ul style="list-style-type: none"> • Estate staff not properly trained to meet challenges • Poor data management 	<ul style="list-style-type: none"> • Provide appropriate training to equip estate staff with new management techniques • Train staff to use existing computers for data storage • Reorganise estate department to make it more responsive to the challenges • Employ more qualified staff • Hand over provision of certain services to contractors 	<ul style="list-style-type: none"> • Devise a training programme to update knowledge and skills of estate dept staff • Reorganise and rationalise dept for efficiency and effectiveness • Out source some services such as gardening, cleaning, etc
<p>Funding</p> <ul style="list-style-type: none"> • Poor funding for new developments and maintenance activities 	<ul style="list-style-type: none"> • Source for grants from other sources • Strengthen revenue generation drive • Release rented properties • Rationalise staff • Increase student charges • Seek donations from external bodies • Review budgetary allocations to the various departments/units 	<ul style="list-style-type: none"> • Solicit for grants from donor agencies • Review the various fees charged student to make it more realistic and generate more funds • Some rented properties to be released • Appropriate rents to be charged for the hostels • Appropriate fees be charged for hire of halls for functions by individuals or groups • Lay off redundant staff • Improve transparency and accountability in the management of finances

Table AK-1 Summary of problems, opportunities and proposals identified at the workshops Source: Field Study Interactive Workshops