IDENTIFICATION OF THE KEY URBAN FACILITIES MANAGEMENT PRINCIPLES OF A SUSTAINABLE URBAN PRECINCT: A CASE STUDY OF EBENE CYBERCITY, MAURITIUS

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: Last, but not least, to my Lord without whom all this would not be possible.

ABSTRACT

Purpose - The aim of this thesis documentation was to identify the Urban FM principles and key criteria which contribute to the attainment of a sustainable urban precinct. The need for a better understanding of the relationship between buildings, people and the urban precinct to facilitate the development of an increased understanding of sustainable cities was highlighted during the literature review. Urban FM, as an emerging field, also created the need for the study of FM principles at a macro scale.

Design/methodology/approach - Using the case study methodology, the research used the case of Ebene Cybercity and adopted a social constructionist, interpretivist framework. Qualitative data was collected using face-to-face interviews as the prime data collection technique and analysed through generation of themes.

Findings - The main findings were that FM principles at a macro scale are mainly applied at a strategic level and as such, implementation of an FM plan needs a strategic awareness and support at the top level of the structure being managed; involving both the political leadership and the top management of the urban precinct. It was also found that implementation of such an FM strategy at the macro scale was allowed through the following key criteria: a clustering effect, flexibility, formal communication channels, design preconditions and macro strategic drivers.

These findings were thus used as a basis for the generation of a model to establish the principles of a macro urban FM strategy and a list of key criteria which facilitate the implementation of such a strategy.

Practical Implications - The thesis finally ends with the proposition for further research in the field of Urban FM at a macro level to strengthen the generalisation to theory and work towards a new infrastructure model firmly anchored in the sustainability principles. The scope for future research in the African context with its low level of urbanisation is particularly relevant where there is need for new, wide-ranging urban policies to create African cities and towns capable of generating sustainable growth and development.

ABBREVIATIONS

ATEQUE	Atelier d'Evaluation de la Qualité Environmentale des Batiments
BIFM	British Institute of Facilities Management
BSI	British Standards Institution
CEC	Commission for the European Communities
CAPEX	Capital Expenditures
FM	Facilities Management
IBMS	Integrated Building Management System
ICT	Information and Communication Technology
IFMA	International Facilities Management Association
ISO	**I**nternational Organisation for Standards
KPI's	Key Performance Indicators
LCC	Life Cycle Costing
NGOs	Non-Government Organisations
ODI	Overseas Development Institute
OPEX	Operating Expenses

OSHA	Occupational Safety and Health Act/Administration
PM	Project Management
POE	Post-Occupancy Evaluation
RICS	Royal Institution of Chartered Surveyors
SAFMA	South African Facilities Management Association
SLA	Service Level Agreement
SPARTACUS	System for Planning and Research in Towns and Cities for Urban Sustainability
SUD	Sustainable Urban Development
WBS	Work Breakdown Structure
WCED	World Commission on Environment and Development

DEFINITIONS

Arpent An old French unit of land area equivalent to 3,420 square metres (about 0.85 acre), the standard measure of land in those areas settled during the French regime.

Parastatal *Adj.* Of an organisation or industry, (especially in some African countries) having some political authority and serving the state indirectly.

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CHAPTER ONE: INTRODUCTION

1.1 Introduction

The aim of this chapter is to introduce the research topic and provide the reader with a brief overview of recent literature relevant to the research question, based on which the problem area is established and the research question derived. An overview of the research aim and proposition and its objectives are then provided, subsequently followed by a concise description of the research method used. The limitations bounding the study are addressed. The chapter concludes with the presentation of the thesis structure.

1.2 Background to the Study

In 1982, *Facility Management* (FM) was defined by the United States Library of Congress as the "*practice of coordinating the physical workplace with the people and work of the organisation"* through the integration of the administrative, architectural, engineering and behavioural aspects of the organisation (Rondeau, Brown and Lapides, 1995:3). Kincaid (1994b) traces the emergence of FM to the integration of three main root activities supporting the core activities of an organisation, i.e. property management, property operations and maintenance, and office administration. Thus, Barrett (1995) defines FM as an integrated approach to the maintenance, improvement and adaptation of the buildings of an organisation with the aim of creating an environment that strongly supports its primary objectives.

Alexander (2006) states that the prime focus of FM is on the aspects of business, industry and the public services which, according to Grimshaw and Keeffe (1992), include the commercial, industrial, health, educational, recreational or housing sectors. Kincaid (1994b) states that FM is part of the support activities – under the

heading of infrastructure -- of the organisation, at the service of those performing its primary activities. Therefore, FM covers the management of major capital resources of the firm and management of its routine and critical support services. In this context, Kincaid (1994b) argues that as FM matures as a practice, the scope for practitioners would encompass infrastructure fields such as transport, utilities and whole urban areas. Thus, Michell (2013:1) argues how FM can play a key role in meeting the objectives of both the public and the private sector to create and manage 'sustainable human settlements, or sustainable cities'.

This notion of adapting FM principles from the building level at a micro scale, to a macro scale, which focuses on the urban precinct, would view the city as the facility, leading to the concept of Urban FM (Michell, 2013). Kincaid (1994b) states that, where management of big mixed use sites harbouring several buildings are concerned, this is already a fact of the present and not a potential avenue of the future.

However, Urban FM has remained an under-researched aspect of FM, according to Michell (2013), because of the many number of fields that are overlapped by Urban FM which includes but is not limited to FM, urban development, urban management and urban sustainability. This is supported by Grimshaw (1999) who argues that diversity is inherent to the very essence of FM and not only as a symptom of a new area of practice and that FM can only be analysed as a multifaceted concept.

The Sustainability Agenda and FM: A Multi-Disciplinary Approach

Grimshaw and Keeffe (1992) acknowledge the multi-disciplinary nature of FM and argue for the need to develop models and theories which unify FM and establish it as central to any organisation. This need is further highlighted by Cairns (2003) who claims that there has been a lack of rigorous research in FM which he terms as a 'fragmented professional/industrial discipline'. Inspired by Best and Kellner (1991), Grimshaw (1999:28) argues that research must provide tools for FM

practitioners to deal with diversity and uncertainty and must seek out knowledge which is 'tentative, probabilistic and reversible'.
A socially inclusive approach to FM adds value to society through the delivery of social, economic and environmental benefits (Alexander and Brown, 2006). Pieterse (2010) argues that there are five dimensions of urban sustainability, namely: physical, environmental, social, cultural, economic and political. Pieterse (2010) also believes that the answer to the sustainability agenda lies in the interaction of these contingent pillars. Early research findings indicate that there is a need for facilities, services and precinct stakeholders to interact, interconnect and be integrated with each other (Michell, 2013). This concurs with Nutt's (2000) argument that manageability needs to become a major design concern to allow for the convergence of management and design priorities and improve the core responsiveness of facilities to the stresses of continuous change. Thus, the future standards for management and design must be dynamic and they must focus on the dimension of time, change and uncertainty, in order for facilities to be planned, designed and managed more strategically (Nutt, 2000).

Grimshaw (1999), citing Davies, Kelly and Charlton (1993), maintains that the problems of FM need to be tackled using an integrated approach outside of the positivist boundaries of social, psychological, managerial, biological, chemical and environmental factors. Thus, each contingent FM problem can be illuminated through the integration of the different areas of study and not simply by highlighting the potential contribution of FM to one or all of these disciplines. Indeed, Nutt (2004a) believes that to allow for a coherent management of infrastructure, facilities and support services, there should be a coalition between the fields of corporate real estate, asset management, property and workplace management, FM and support services.

Rondeau *et al.* (1995:7) state that FM incorporates the properties of 'acquisition, design, construction, maintenance, and operation and support services' for people and buildings. Using the same premise, Michell (2013:1) argues that, based on the very precepts of the FM field i.e. of 'place, space and time' (Nutt, 2000), the FM discipline's response to the development and maintenance of sustainable cities will

stem from a better understanding of the relationship between buildings, people and the urban precinct.

In this sense, Michell (2013) affirms that the physical infrastructure of an urban precinct is a critical feature in the spatial experience of the said urban precinct, and therefore in the attainment of sustainable cities. Thus, a major determinant to successfully implementing a sustainable urban precinct, as per Michell (2013), is by identifying, providing and managing major infrastructure within the precinct. This is in line with the UN-Habitat's World Cities Report 2016 where sustainable infrastructure i.e. the interconnected physical and organisational structure, the services and system supporting the daily functioning of a society and its economy is defined as core component of a sustainable cities agenda (UN-Habitat, 2016).

Michell (2013) further argues that the interaction between the private sector, the public sector and participants to the urban precinct is a major driver of the successful implementation of this sustainability agenda at the macro level. This echoes Roberts (2004:349) who defines Urban FM as *"the integrated provision of public service accommodation and community support services"*. In this regard, Roberts (2004) sets forth that the FM industry will have to develop new models of governance allowing the citizen a role in co-producing the services that are provided by the private sector, well versed in managing the capital and service challenges that are required. Alexander (2006) expresses the idea that community management, through the investment and management of public facilities and services, can be outsourced to professional service providers. Thus, Urban FM stems from the need to reinvest in communal infrastructure and provides a platform for the collaboration between agencies and the private sector in this context. Michell (2013) also pushes for the development of Urban FM and a transdisciplinary research as the answer to the sustainable cities agenda.

1.3 Problem Area

The problem focus area of this study may be stated as:

The principles of FM evolved from the needs of individual organisations, and hence, of stand-alone facilities. However, from the emergence of Urban FM, there is the potential for these principles to be extrapolated, from a micro level, to contribute to the establishment of a sustainable urban precinct, at a macro level which in turn affects the long-term sustainability of cities and/or urban areas. In this regard, little research has been undertaken in the emergent concept of Urban FM and its application to the management of urban precincts and therefore the attainment of sustainable cities or urban areas.

1.4 Research Question

The research question to be addressed in this thesis may be stated as:

What Urban FM principles and key criteria contribute to the attainment of a sustainable urban precinct?

1.5 Research Proposition

The research proposition to be tested in this study is:

The Urban FM principles and key critiera that contribute to the attainment of a sustainable urban precinct can be identified.

1.6 Research Aim

The intended aim of this research is to:

1.6.1 Identify the key criteria allowing the implementation of Urban FM at a macro level for a sustainable urban precinct, and

1.6.2 Identify the key principles of Urban FM that are applied at a macro level to operate a sustainable urban precinct.

1.7 Research objectives

The research objectives are to:

1.7.1. Conduct a literature review on the scope of Urban FM by using traditional FM as a stepping stone and establishing the extent to which the theories of FM can be applied in an urban context and at a macro level,

1.7.2 Identify the key role players in the operation of the urban precinct,

1.7.3 Identify the key criteria facilitating the implementation of Urban FM at a precinct level, and

1.7.4 Identify the critical FM principles being applied at the scale of the urban precinct.

1.8 Research methodology

The above objectives will be achieved by adopting a social constructionist, interpretivist framework consisting of the following research method:

1.8.1. A literature review on the theory of FM and the scope of Urban FM.

1.8.2. A case study methodology on an urban precinct. The following research methods were utilised:

- focus groups as preliminary data collection,
- a series of in-depth interviews,
- photographic material, and
- documentary evidence.

1.8.3. The issues around the ethical issues and concerns in the research were documented in Sections 3.4 and 3.4.5 in **Chapter 3**.

1.8.4. Analysis of the data with a view to identifying the Urban FM principles and key criteria which can be applied at a macro level

1.8.5. Lastly, conclusions are drawn and recommendations made.

1.9 Limitations

This study is subject to the following limitations:

1.9.1 The urban precinct is defined, thus restricting the range of possible outcomes in the data collection and data analysis,

1.9.2 A single case study is being undertaken, thus results and conclusions cannot be viewed as generalisable to the wider population, and

1.9.3 The research methodology employed is likely to result in certain predispositions to the data, as well as individual opinion. It is acknowledged that this is intrinsic to a social constructivist philosophy.

1.10 Structure of the Thesis

This thesis contains five chapters.

The research topic is introduced in **Chapter One** which starts with a background to study from the literature that is available on the thesis topic. The problem statement and the research question are outlined with the objectives of the thesis then identified, followed by the methods of research and the limitations to the thesis research.

Chapter Two provides the theoretical framework for the thesis by presenting a more comprehensive literature review of the topic. This chapter identifies the need for further study of Urban FM by using the traditional theory of FM as a base and looking at its application in an urban context.

Chapter Three outlines the research methodology employed and the different data collection techniques adopted during the study. These are based on the literature review and the different qualitative research methods available.

The data gathered from the case study of an urban precinct on the island of Mauritius, together with the analysis of the findings, are presented in **Chapter Four**. This allows for the identification of the principle components that comprise the FM strategy implemented in the case study.

Chapter Five is the final chapter and provides the conclusions to the research. The research question and research objectives are revisited. Lastly, conclusions are drawn with respect to this research and recommendations are made for future potential research that can be undertaken in the field of Urban FM.

CHAPTER TWO:
THE THEORETICAL AND CONCEPTUAL FRAMEWORK

2.1 Introduction

After outlining the research problem and the research question in **Chapter 1**, this chapter focuses on developing the contextual and theoretical framework for this study so as to allow the researcher to explore the problem area and the theoretical foundation for the research question. In this regard, the chapter starts with an outline of the principles of sustainability and a review of urban theory so as to reach an understanding of the sustainable urban precinct. This is followed by a critical review of the theory of FM. The chapter ends by identifying the emergence of Urban FM and its practice as a multi-disciplinary field of study. In conclusion, inferences are drawn on the possibility of extrapolating FM principles from a micro to a more macro premise at the urban precinct level to achieve the sustainable urban areas.

2.2 The Sustainable Urban Precinct

To understand the concept of a sustainable urban precinct, a discussion of the term *sustainability* and a definition of the *urban precinct* are required. Thus, this section starts by outlining the evolution in the understanding of the sustainability agenda over the past three decades. It is followed by an overview of urbanisation through a study of urban theory and concludes with an outline of what is meant by a *sustainable urban precinct.*

2.2.1 Definition of Sustainability

The Brundtland Report (WCED, 1987:41), from the United Nations, first defined sustainable development as:

"…development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

However, Curwell and Cooper (1998) maintain that a major hurdle in the progress of the sustainability agenda has been the lack of clarity in the meaning of the terms sustainability and sustainable development. Johnsto,n Everard, Santillo and Robert (2007) affirm that since its inception almost three decades ago, the concept of sustainable development has been characterised by a proliferation of definitions. This echoes Palmer, Cooper and van der Vorst (1997) who deplore the fact that fuzzy buzz terms are used to encapsulate a discrete notion which, in fact, has multiple interpretations. Johnston *et al.* (2007) denounce that, with increasingly different meaning to different people, its credibility has been limited, its practical application has been questioned and the very progress in environmental and social developments which it was designed to underpin has been hindered. Curwell and Cooper (1998) point out the hindrance to effective progress until a more common understanding of, and a common aspiration for, sustainable development are achieved.

Reviewing the early literature on the subject, Mitchell, May and McDonald (1995) identified four common principles of sustainable development, namely Futurity, Environment, Public Participation and Equity. These principles, as adapted by Curwell and Cooper (1998:20), are illustrated in **Figure 1** below.

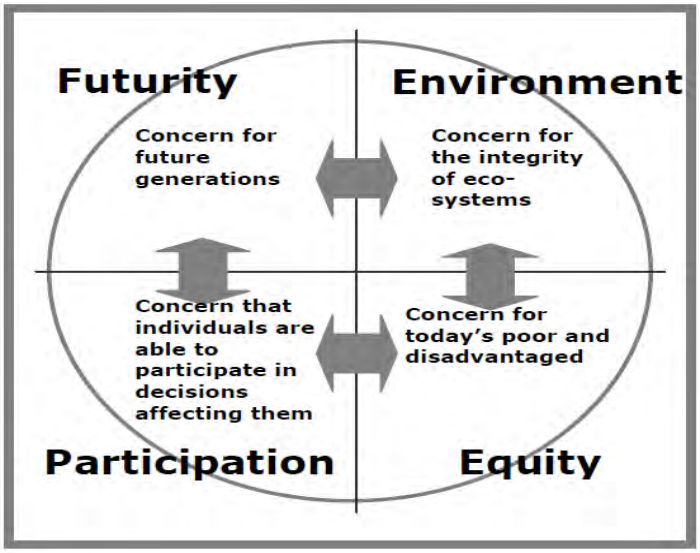


Figure 1: The adapted PICABUE model showing the four principles underlying sustainable development

Source: Curwell and Cooper (1998:20)

The first principle implies a moral relationship between the present and future generations running in the long term with the need for sustainable development to act as a standard for contemporary society (Laws *et al.*, 2004; Hansmann *et al.*, 2012 citing Scholz, 2011). The *Environment* pillar relies on the preservation of the integrity of eco-systems and the protection of biodiversity. *Public participation* is in line with Principle 10 of the Rio Declaration on Environment and Development (UNCED, 1992: 2) whereby "*environmental issues are best handled with the participation of all concerned citizens . . .each individual should have . . . [information], and the opportunity to participate in decision-making processes*" The principle of equity requires fair shares, locally and globally; with equality of access to the world's global resources acting as the guiding principle.

Curwell and Cooper (1998) observe that only one of these four principles deals directly with ecological factors, while the remaining three are actually concerned with political and socio-economic issues focusing on allocation of resources in time or space and processes of decision-making. These three can be seen as being more directly concerned with a human development agenda than with the sustainability of the planet itself.

The need to expand the initial focus from the environmental agenda to integrate the social and economic dimensions saw the coining of Elkington's essential principle of the triple bottom line, in 1997, in the form of the planet, people, and profits; i.e. the natural, human, and economic capital (Elkington, 1997). Thus, sustainability became recognised as an integrative concept with its three pillars being the environmental, social, and economic aspects.

Costanza and Patten (1995), on the other hand, argue that sustainability is less a problem of definition and more a problem of predictability. According to this argument, definitions of sustainability typically list a set of preferred characteristics, relating to the global socio-economic and ecological support systems. However, these characteristics are both the desirable goals and the factors predicting the characters needed to allow the system to be sustained. Costanza and Patten (1995:195) further describe a metasystem as "*a nested hierarchy of systems over a range of time and space scales"*. The metasystem, thus, would allow for hierarchical interactions between systems and sub-sytems such as socio-economic and ecological subsystems.

Moving from the benchmark definition of the Brundtland Report (WCED, 1987) a widely accepted definition has been provided by the manifesto of the second World Conservation Strategy report in *Caring for the Earth* (IUCN-WWF-UNEP, 1991:10). It defines sustainable development as "*improving the quality of human life while living within the carrying capacity of supporting ecosystems*" and sustainable economy to be a derivative of sustainable development. Quality of life and ecological integrity thus become the epicentre to the sustainability agenda.

Based on the *Caring for the Earth* manifesto, Mitchell *et al.* (1995) provide a framework, as per **Figure 2** to understand the indicators of *quality of life* which are made of tangible such as the physical environment, natural resources and social infrastructure and less tangible elements such as personal and community developments, security and health.

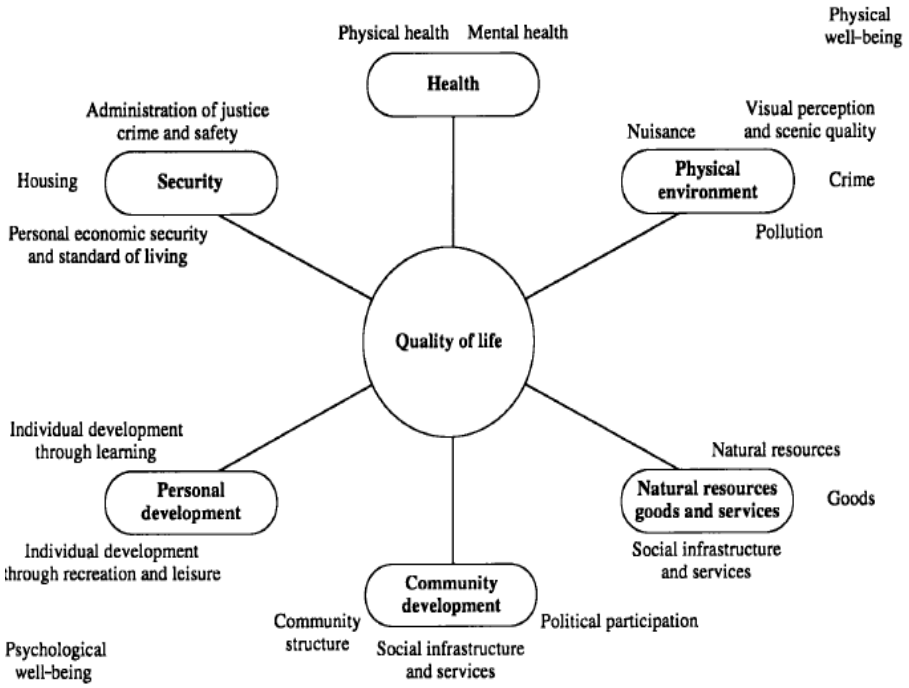


Figure 2: A classification of quality of life components

Source: Mitchell et al. (1995:111)

Curwell and Cooper (1998) established the paradox of a sustainable society facing the need to maintain a good standard of living for all humankind, through the flows of production and consumption, while concurrently supporting the local and global ecosystem. However, Hansmann *et al*. (2012) argue that positively integrating the three sustainability pillars is essential to effectively facilitate sustainable development, thus making the case for sustainability-oriented decision making that should rather focus on positive synergies of the three pillars and less on the trade-offs between them. Similarly, Costanza and Patten (1995) argue that, instead of focusing on particular subsystems, to predict the sustainability of a system, the characteristics which show consistency with all the subsystems' interactions must be aimed at.

Further to the above discussion on the principles of sustainability, the following section seeks to provide a framework to the urban premise of the problem area and the theoretical foundation for the research question through a review of urban theory.

2.2.2 Background to Urban Theory

In the last two hundred years, world population and world urbanisation have grown continuously and cities, considered as the world's economic dynamos, are expanding at a rate and scale that are unprecedented. Today, urbanisation has reached new heights of development, both in the more economically advanced parts of the world and in many less developed parts too, and more of humanity is currently urbanised than ever before (Scott and Storper, 2015). According to the McKinsey Global Institute (2012), by 2025, emerging and expanding cities could inject up to $30 trillion a year into the world economy through a combination of consumption and investment in physical capital. According to the UN-Habitat World Cities Report 2016, cities are home to 54 per cent of the world's population, a figure that will rise to 66 per cent by 2050 (UN-Habitat, 2016). Thus, understanding cities, their morphing demographics and the 'urban consumers' is critical to prepare for the challenge of the ever increasing demand for natural resources and for investment in new infrastructure including housing, offices, and port capacity (McKinsey Global Institute, 2012).

Historically, urbanisation has been brought about by a complex interaction between 'economic development, divisions of labour, agglomeration, specialisation, and external commerce' (Scott and Storper, 2015:13). Thus, in the contemporary era, the fundamental reason behind the existence of cities resides in their role as centres of economic production and exchange within wider systems of regional, national, and international trade. Additionally, cities, through their agglomeration dynamics, are marked by the social, political, administrative and cultural dimensions of human life, which affect the form of production and exchange (Scott and Storper, 2005).

The urban land nexus is an interacting set of land uses resulting from the ways in which the social and economic activities of the city lend to a differentiated, polarised, locational montage (Roweis and Scott, 1978; Scott, 1980; Scott and

Storper, 2005). It thus corresponds to the very fabric of intra-urban space. The urban land nexus is made up of three divisions namely *production space* represented by the firms through the concentration of employment, the *social space* defined by the households in residential neighbourhoods and the *circulation space* as represented by the infrastructures and arterial connections that aid the flows of goods, people, and information in the urban area (Roweis and Scott, 1978; Scott, 1980; Scott and Storper, 2005).

Defining 'The Urban' for the Purpose of the Research

The Oxford English Dictionary (2016) defines urban as "*in, relating to, or characteristic of a town or city*". Harding and Blokland (2014:19) describe urban theory as "*a body of ideas explaining one or more aspects of reality within, or of, towns and cities*" but call into question the definition of a city or town, and their difference from any other form of place. No universal and unimpeachable definitions of the city and the town exist but, depending on the sub-fields under analysis, social scientists have devised their relevant definitions (Harding and Blokland, 2014). Moreover, Harding and Blokland (2014) argue for the case that if the term *urban* is not specific then the theorist working in a particular sub-field needs to devise definitions that identify the theoretical object of urban studies more precisely. Thus, political scientists define cities, however imperfectly, by the boundaries of political decision-making; that is, by areas covered by a local or metropolitan government. On the other hand, urban sociologists tackle urban problems by taking the city as a receptacle of other sociological occurrences studied within the city (Harding and Blokland, 2014). Economists perceive them as the locus for concentrated socio-economic interaction between individuals and firms and the drivers of production and economic growth of the nation (Rees, 1992). The universal nature of the *urban* is summarised by Pahl's (1970: 209) comment that 'in an urbanised world, "urban" is everywhere and nowhere; the city cannot be defined'.

Gottdiener, Hutchison and Michael (2014) argue that there is need for a field that would deal with all forms of human settlements – towns, cities, suburbs,

metropolises, the multi-centred region, the megapolis – so that the city is no longer considered as the only form of urban space. Thus, an integrated approach of the forever competing paradigms of ecology, economy and culture can be discussed at all levels (micro, macro and meso) following the synthesis of the socio-spatial approach.

Harding and Blokland (2014) state that urban studies, for all their diversity, focus upon analysing the different aspects of a particular historical form of human settlement. So, in conclusion, it can be argued that urban land can be simultaneously private and public in nature and concurrently individual and collective in its features and that the weaving dynamics of the individual actions of firms and households and collective action of institutions of governance will shape and form it (Scott and Storper, 2015).
Labelling the precinct as the microcosm of city-wide urban development, the Climate Group (2015) defines it as a geographically bounded area with its critical size ranging from a city block to a new suburban development taking the form of a greenfield or brownfield site and intended for either residential, commercial, industrial or mixed-use development.

2.2.3 Assessment of the Sustainable Urban Precinct

Williams, Jenks and Burton (2000) claim that in order to achieve sustainable urban form one needs to know what it is A well-defined concept which carries a general consensus is required to understand the sustainable city i.e. in terms of its shape, the ways in which it will function and how it will evolve in time (Williams, Jenks and Burton, 2000). Sustainable infrastructure refers to the design, development, maintenance, reuse, and operation done in a way that minimises strain on resources, the environment and the economy (UN-Habitat, 2016). Spatially, contemporary urban centres are constituted of a complex system of existing buildings, transport and infrastructure systems developed over time (Symes, Deakin and Curwell, 2005). Thus, according to (Symes, Deakin and Curwell, 2005), Sustainable Urban Development becomes a long-term process of adapting

the existing built environment in order to achieve more sustainable ways of living and working.

One way of assessing sustainability is to define an unsustainable settlement. According to Deakin and Lombardi (2005), the negative view of the unsustainable city was summarised by Ekins and Cooper (1993) with three distinctive aspects. The first aspect would be an environment which has become so degraded -- with an overcrowded, obsolete and inefficient infrastructure -- and so polluted that is endangering human well-being. The second indication is an economy that can no longer support the population's expectations for either wealth creation or quality of life. Lastly, the third aspect is a dysfunctional society contributing to increased stress, crime rates, alienation and mass exodus.

Brandon and Lombardi (2011) affirm that the categorisation of the stakeholders in the built environment and the users of the information from any evaluation technique is important. The French ATEQUE workshop (1994) proposes a comprehensive classification of all the stakeholders and actors in the built environment axed on five different poles. Thus, civic service providers, such as government authorities and local agencies, lie on the pole of collective interest. Private service providers are divided into the poles of *operational decision-making* to include property development companies and financial institutions, the pole of *design* including designers, planners, and finally on the pole of *production* including contractors. On the pole of *use*, actors are made up of mixed public/private service providers such as transport and utility service providers and facilities managers, and finally of the end users of the whole infrastructure, that is, the building, the open space, the utility services amongst others. Brandon and Lombardi (2011) show how the increasing spatial boundary of the sustainability agenda entails an increasing level of complexity and the collaboration of a growing number of actors as per **Figure 3.**

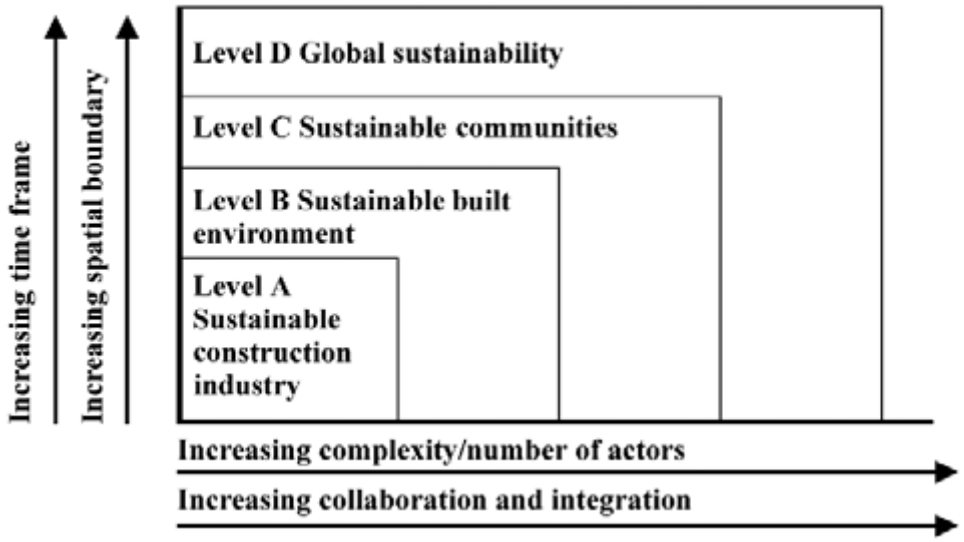


Figure 3: The levels of response to sustainable development
Source: Brandon and Lombardi (2011:10)

Thus, a common language and a framework for assessing and evaluating urban sustainability are required, according to Symes, Deakin and Curwell (2005), so that contemporary local governments can make sustainable development more operational. The authors further point out that many sustainability indicators are now available and there exist criteria by which the indicators themselves can be evaluated.

Characteristics of the Sustainable Urban Precinct

It is globally recognised that the long-term sustainability of cities and urban precincts is crucial to all cities and/or urban areas (Michell, 2013) and the following section briefly discusses the three pillars of sustainability in terms of urban development, namely: environmental, social, and economic.

i. The Environmental Pillar

Curwell and Cooper (1998) state that a city is a living entity and that the environmental impact is the sum of that resulting from all the individual actions of the population. In fact, Ekins and Cooper (1993) observe that any human

settlement, whether a city or individual building, has an impact on the land area supporting it. Thus, the first characteristic that the sustainable urban precinct will need to incorporate is the ecological element. The sustainability of a settlement or building depends on the interaction between its level of demand on the land's resources to support the land pattern uses and where the boundary of the area required to support it is drawn. This external resource base is what was coined an 'ecological footprint' by Rees (1992:121). In this sense, a settlement or building's ecological footprint is many times larger than the physical footprint it occupies. Sustainability only exists when the settlement's ecological footprint equals to or is smaller than its physical footprint. According to Rees (1992), this is only achievable through the minimisation of resources used, sourcing these locally and minimising the consequent pollution and waste However, in order to survive, buildings or cities rely on the resources of geographically removed areas leading to the possibility of ecological or geopolitical instability. Consequently, Rees (1992) justifies that the conflicting dynamics of environment and development have resulted in tensions between the northern and southern hemispheres; between the developed and developing countries, with an unfair use of the planet's resources by the former.

ii. The Social Equity Pillar

The social equity principle requires that the most vulnerable and disadvantaged people in society have a satisfactory quality of life i.e. access to resources and development opportunities, and freedom from threat. The equity principle is based on rationality, self-interest and on the realisation that reduced social deprivation implies less pressure on critical natural systems and on the precept that social deprivation is morally undesirable (Curwell, Deakin and Lombardi, 2005). Equity in the allocation of resource also implies that concerned stakeholders should be able to participate in the making of decisions that affect them. The importance of participation is further highlighted by Curwell, Deakin and Lombardi (2005) who argue that sustainable development is a process that takes place over a long time frame with natural and human systems which are ever-changing and unpredictable.

iii. The Economic Development Pillar

An important pillar to urban sustainability is the economic dimension whereby globalisation and the shift to a knowledge society have strengthened the role of cities as nerve centres of the new economy (Castells and Hall, 1994). Elkin, McLaren and Hillman (2000) also highlight the importance of urban centres to the economic order. Paskaleva-Shapira (2009), citing Franke and Verhagen (2006), Hall (2004), Healey (2004), Jacobs (1984) and Landry (2000) reinforce the notion that cities, with their diverse economies, often form the platform for new developments, economic innovation and creative processes. Paskaleva-Shapira (2009:250) emphasises that the major challenges to the economic sustainability of cities are 'economic viability of the community', 'urban additionality', 'business profitability', 'corporate and locational competitiveness' and 'allocational, productive and dynamic efficiency'. Symes, Deakin and Curwell (2005) state that the economic dimension also encompass considerations ranging from the financing of the infrastructure, transportation systems and utilities to the more general employment of resources in the urban development process. Thus, Paskaleva-Shapira (2009) states that reconciling urban competitiveness with sustainable development objectives and approaches poses a new test for urban developers.

Urban Sustainability

Curwell and Cooper (1998) demonstrate that groups of people in the built environment show concerns to the four different sustainability traits to different degrees depending on the scale that they work at. Thus, people at the building scale focus mainly on issues of futurity and environment whilst those working at the city scale show higher concern to the question of equity and public participation as shown in **Figure 4**.

Curwell's and Cooper's (1998) research also highlighted that only at the level of the lowest common denominator is a shared agenda on sustainability observed,

despite the interest in assessing the built environment being a collective one. Also, the research participants only showed a rudimentary common understanding of how this challenge could be undertaken conjointly.

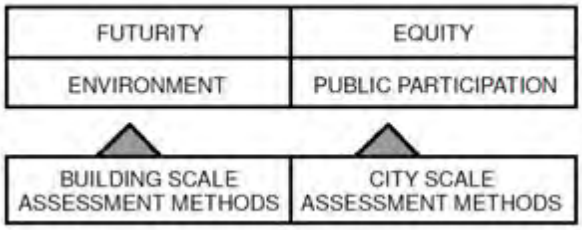


Figure 4: The predominant focus of environmental assessment methods at different scales
Source: Curwell and Cooper (1998:21) citing Cooper, 1997

Curwell and Cooper (1998) developed a non-exhaustive list of actions for each of the development stakeholders in pursuit of sustainable development at both the individual building and at the urban precinct over the design stage. This aims to reduce development risks and uncertainties and allow for the creation of urban infrastructure that will clearly facilitate rather than impair the sustainability agenda and contribute to quality of life.

Thus, while designers and developers will need to accept the need for and welcome wider participation in development decision making, such participative processes will have to be efficient and cost-effective. The design team and the developers will need to aim at greater resource efficiency in the building and infrastructure procurement. Policy-makers need to recognise the principles of sustainability and work with a clearer lead and a clearer vision of sustainable urban development and provide a better regulatory and fiscal background in that sense.

2.3 Background to FM

The main objective of this chapter is to provide an overview of the theory behind Urban FM. Prior to this, there is need to start by defining FM in broad terms as conceived by several researchers and to provide a conceptual framework of the

research including a discussion of the future of FM. This section then moves on to examine the scope and the role of FM in the sustainability agenda.

2.3.1 Definition of FM

As adopted by the BIFM, the definition of FM provided by CEN (European Committee for Standardisation) under EN 15221 and ratified by BSI British Standards is as follows:

"Facilities management is the integration of processes within an organisation to maintain and develop the agreed services which support and improve the effectiveness of its primary activities".

FM is further defined by various researchers and practitioners illustrating the wide scope of the discipline. Becker (1990:180) describes FM as a 'function of planning, design and managing' of built assets for the achievement of business goals. Alexander (1996), on the other hand, explains the concept of FM as the process of enhancing quality, minimising costs and managing risks within the private sector. Finally, Solomon and Cloete (2006:306) define FM as "*the co-ordination of the physical workplace with the needs or objectives of the organization*". Indeed, Price (2002) comment that FM was still debating its status in academia and as a profession. More than a decade on, this lack of a standard international definition and use is recognised by the RICS (2015) which accounts it to the fact that FM is still a developing profession.

However, Weeks (1993), argues against the need for a unifying vision in the contemporary agenda, rejecting the need for a coherent framework. He holds that values generate principles and goals and ultimately guide the development of policies. Grimshaw (1999) finds a resonance for FM in this vision and argues that a unifying theory of FM supported by its own body of knowledge is not preconised and that searching for common values is more relevant than theories. This view is completely disregarded by Jensen (2008) who argues that a discipline is born only when people within a work field generate a community to define the discipline and

ensure its development through the institutionalisation of the discipline. He argues that disciplines do not emerge from technological and structural changes in society (Jensen, 2008).

Historically, the term FM gained prominence in the 1970's starting from the USA and spreading to the European countries and other parts of the world (van Wagenberg, 1997). Emerging with its roots in the operational and maintenance issues of a building, which was the responsibility of the building caretaker, FM was born as a discipline through the need for more efficient ways of managing the rising operational costs of increasingly complex buildings (Price, 2003). As the triple bottom line of people, planet and profits (Alexander, 2006 citing Parkin, 2000) became a prime concern, the role of FM as a discipline broadened to incorporate the management of human resources and information technology involved in the running of a facility. Additionally, Atkin and Brooks (2005) argue that a more complete and contemporary definition of FM should encompass building and engineering services as well as more corporate concerns including management of properties, finances and contracts, human resources and health and safety.

Based on the CIOB's definition of Project Management (PM), Alexander (1996) identifies defined start and end dates and limited amount of committed resources as the key characteristics of a project. Thus, Alexander (1996) argues that the FM practice will often encompass that of Project Management since in the FM discipline, many activities can be defined as a project. Alexander (1996) maintains that, since FM is responsible for both projects and any on-going variety of operational activities, the FM and any separate project management teams will need to use and coordinate resources and logistics so as to minimise disruption to the operations of the organisation. Consequently, according to Alexander (1996), the same management skills of quality, value and risk will apply to both disciplines and thus, for any facility, these two disciplines will co-exist and overlap.

In conclusion, Then (1999) presents FM as a management discipline with a hybrid natuers that combines expertise in managing people, property and process so as to provide the necessary support services to the organisation.

2.3.2 Conceptual Framework of FM

Besides the maintenance and operational services provided by the FM discipline, organisations should recognise the range of business services that exist in the FM context (Becker, 1990). Alexander and Brown (2006) state that FM has evolved outside the original primary focus on business, industry and public services perspective and setting to providing strategic direction through leadership. However, Grimshaw (1999) argues that if FM is to be strategic in large organisations, it will become an increasingly political activity. This has been accentuated in the last few decades where the shift of power from national governments to multinational organisations has been increasing. Atkin and Brooks (2005) stress the importance of FM in order to understand the organisation's needs and objectives since the effective management thereof, as explained by Becker (1990), will aid towards the minimisation of costs at the operational and maintenance levels and raise satisfaction of stakeholders.

Grimshaw (1999) points out the contradictions that exist in the FM discipline in practice and its professed position in academia. While FM claims to be a strategic discipline, most of its practitioners in their respective organisations are at an operational level; despite its proclaimed desire to be part of organisational development, many of its services are delivered either by external or in-house consultants behaving as onlookers; and while FM professes to be proactive in managing organisational changes, it is clearly reactive in most cases.

Grimshaw (1999) states that many organisations are undergoing cultural change, and this will have an impact on the form and management of their facilities. Alexander (1994), on the one hand, shows that the implementation of FM relies on a firmly established FM policy which would uphold corporate values and provide higher quality service, facilitate the expansion of facilities to attain business goals

and which would highlight the additional value that FM brings to a business. Similarly, McLennan (2004) calls for greater coherence around activities involved in the FM sector so as to avoid misunderstanding of FM in the general business sector through the lack of a conceptual or theoretical management framework. In contrast, Grimshaw (1999) argues that it must be acknowledged and accepted that there may not be a defined right or wrong FM approach in these circumstances, since each approach will be contingent on different FM organisations and policies.

Repositioning FM

Grimshaw (1999:25) argues that FM is both a 'child and a symptom of change'. Based on Donald's (1994) illustration that FM holds the ring between an organisation, its employees and its physical space, Grimshaw (1999:25) underlines that the evolving social, political and economic movements underpinning FM are changing the relationship between these three elements. Thus, FM is not only facing technical challenges in an organisational context, but the impact on physical facilities and people of the cultural change within the very organisations.

Grimshaw (1999) argues the case that FM is better explained by the post-modernism interpretation of the world as opposed to the modernist view which he believes to be overly legislated, defined and classified. Modernism, described as the age of rationalism, relies on the nation state democratically formed where experimental science, in its positivist nature, is centrally placed.(Lyotard, 1992, cited by Grimshaw, 1999). Change, in a regulated form, is inherent in modernism. However, modernist research paradigms are unlikely to be able to deal with the evolving relationship between the state and the individual, and between the state and organisations which are the most significant to FM.

In contrast to the aversion of modernism to diversity, postmodernism accepts it and acknowledges that particular problems can only defined with imperfect and temporary meanings which might not hold in time.(Davies, Kelly and Charlton, 1993) and thus, FM, as a multidisciplinary, multifaceted phenomenon is better supported by a postmodern view of the world (Grimshaw, 1999).

Although Nutt (2000) differentiates between the objectives of FM at national and local levels, where the former is more strategic and the latter is more about the effective management of facility resources and services, Nutt (2000) concludes that the main function of FM is resource management at both levels of support.

Nutt (2000) also identifies, in the form of the management of business, people, property and information, four resource types which are fundamental to the FM function. Thus, extrapolating from these four key resources – 'financial resources, human resources, physical resources, and the resources of information and knowledge' --, four competing futures for the field of FM are projected in the short-term and long-term, as per **Figure 5**.

Figure 5: Generic Trails of FM to the Future
Source: Nutt (2000:125)

Projecting to 2020, Nutt (2000) predicts that all four trails will likely undergo radical change by merging, diverging, splintering or generating new sub-trails. Nutt (2000) emphasises that although the four trails work towards the common goal of providing strategic and operational support, they compete against each other through their conflicting priorities and interests. He advises that all the stakeholders in the FM field must accept and welcome the diversity, variety, and

ambiguity in the possible futures of FM and allow for positive outcomes from the creative tensions between the four trails.

Amaratunga *et al.* (2000) believe that the management of facilities goes beyond the operational perspective of building to include the monitoring of the facility's efficiency. Atkin and Brooks (2005) affirm that this allows the achievement of best value decisions. Chotipanich (2004) explains how common technical perspectives must be shed if a holistic approach to the positioning of FM in any organisation is to be addressed. This echoes Alexander (1996) who claims that FM has reached a more managerial sphere and moved away from the routine technical base. **Figure 6** below illustrates the positioning of FM in the organisation with respect to the latter's objectives and the internal and external factors affecting its environment.

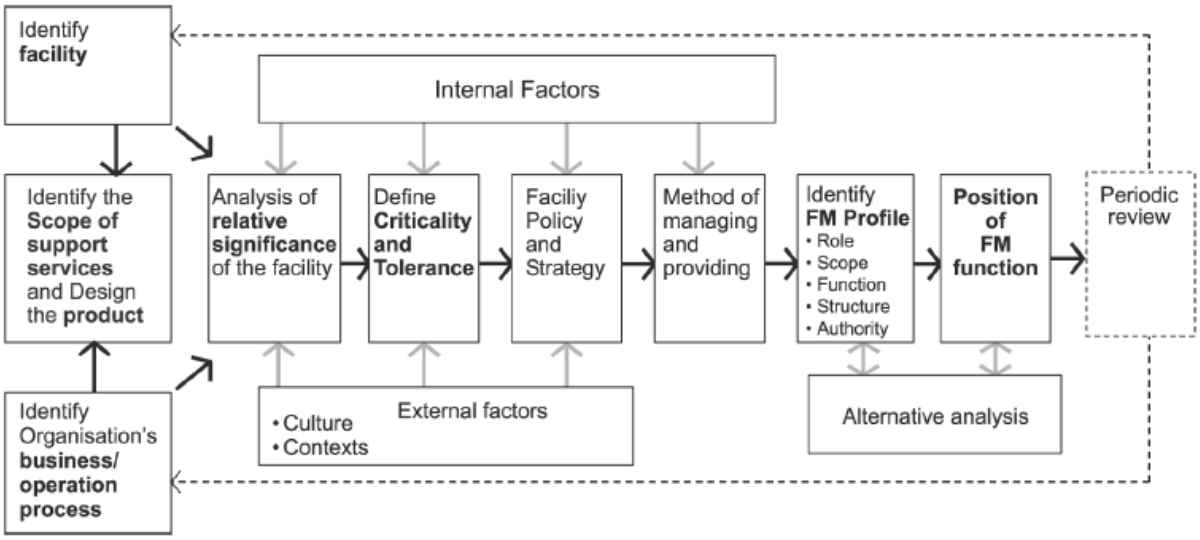


Figure 6: Theoretical Model for Positioning FM

Source: Chotipanich (2004:370)

Alexander (1996) explains that the application of FM on the operational, tactical and strategic bases will operate at the junior, middle and senior management levels respectively. Langston and Lauge-Kristensen (2002) hold a similar view of these three levels in FM. Strategic FM align the facility's operation with corporate goal through proactive decisions that would surmount potential problems. Tactical FM relates to the performance management of the facility whereas Operational FM deals with the daily maintenance activities. The FM model developed by Barrett

(2000) however encompasses both the strategic and operational components of FM as shown in **Figure 7**. This echoes the linking of the technical and organisational dimensions as observed by Nutt (1999). **Figure 7** describes the generic FM model in terms of the relationship between the FM organisation at the operational and strategic levels and the core business organisation at different time scales i.e. the present and future environments. The model highlights six principal linkages, (1)-(3) at an operational level and (4)-(6) at a strategic level. Thus, according to this model as shown in **Figure 7** (Barrett, 2000:423), the operational level of the FM organisation deals with ascertaining that the current needs of the stakeholders of the core business are met within the current legislation. At the strategic FM level, the FM organisation deals mainly with the future needs and objectives of the core business taking into account the external factors and possible future changes that may affect these.

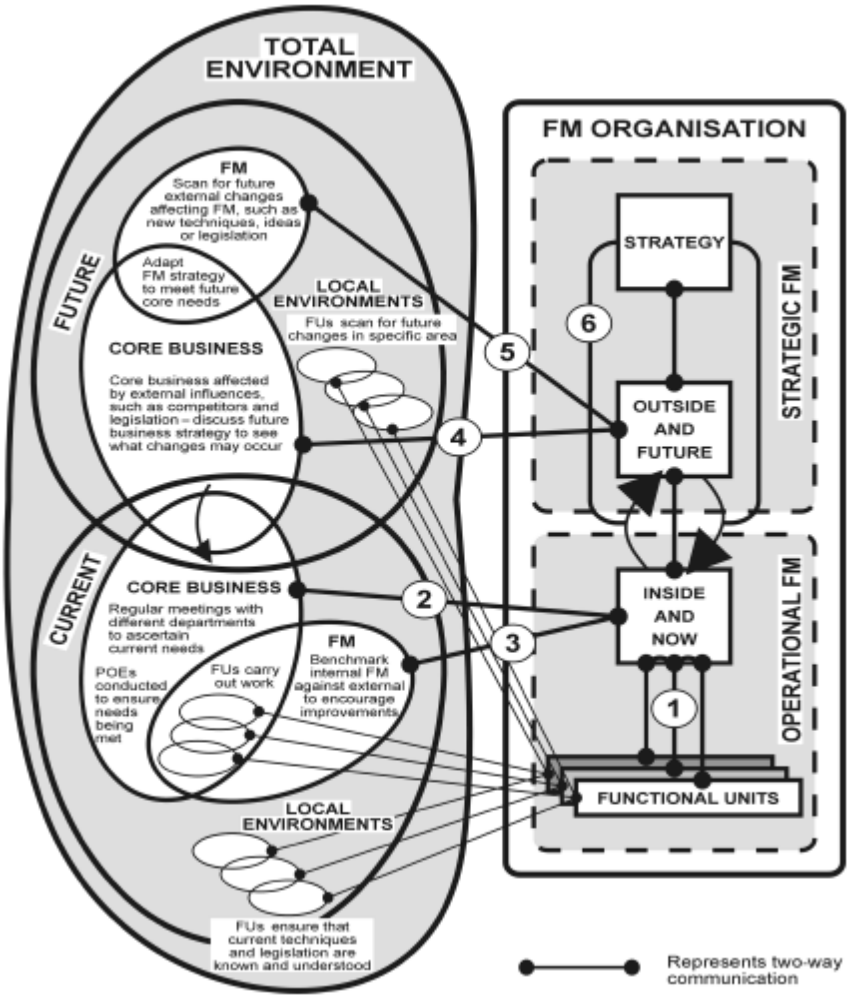


Figure 7: Generic FM Model

Source: Barrett (2000:423)

2.3.3 Scope and Role of FM in the Sustainability Agenda

According to the South African Facilities Management Association (SAFMA), FM serves to enable the performance of an enterprise in a sustainable way through the management of the sum of the productive workplaces and effective business support services (SAFMA, 2016). According to Brandon and Lombardi (2011), the question of management lies at the very heart of the sustainability agenda.

The British Institute of Facilities Management (BIFM, 2015) states that effective FM -- through the combination of resources and activities -- contributes to the delivery of strategic and operational objectives at a corporate level and to the provision of a safe and efficient working environment on a day-to-day basis. It,

therefore, contributes vitally to the success of any organisation independent of its size and scope.

Hudson and Curwell (2004) use the key areas outlining the range of functions of the Facilities Manager from the competencies defined by the BIFM as a framework to understand the role of FM in tackling sustainable urban development issues. The competencies are categorised into six key management areas which are: the understanding business organisation; the management ofpeople; management of premises; management of services; management of the working environment; and management of resources (BIFM, 2015). Deakin, Hudson and Symes (2005) apply the Sustainable Urban Development (SUD) framework of the BEQUEST initiative as a comparison tool for the BIFM's competency areas. The roles of the Facilities Manager are thus determined and categorised according to the sustainability pillars of the SUD model in **Table 1.**

Table 1: A matrix of BIFM competencies against the SUD model

BEQUEST SUD model	*BIFM competencies: key management areas*					
	Understanding business organisation	*Managing people*	*Managing premises*	*Managing services*	*Managing the working environment*	*Managing resources*
Environmental	FM strategy to support corporate environmental policy	Effective staff training in environmental issues	Local/global environmental impact -bio-diversity, Co_2 emissions	Energy efficiency Local/global environmental impact	Waste management Transport	Green procurement Risk management
Economic	FM strategy to support corporate economic policy	Manpower planning Sourcing strategy	Life-cycle planning Maintenance and operational costs	Energy costs Maintenance and operational costs	Productivity	Value for money Procurement Risk management
Social	FM strategy to support corporate social responsibility policy	Fair and safe employment policies Responsible dealing with suppliers Community impact of employment policy Conflict management	Usability Accessibility User participation Security	Usability Accessibility User control	Quality of life	Socially responsible procurement Risk management
Institutional	Companies Act Benchmarks	Transfer of Undertakings (Protection Of Employment) Regulations 1981 (TUPE)	Disability Discrimination Act (DDA) Environmental management systems (EMS) Building regulations	EMS Climate change levy	Health and safety	

Source: Deakin, Hudson and Symes (2005:128) - BEQUEST

i. *Understanding the business organisation*

In analysing the role of Facilities Managers from an environmental psychology perspective, Donald (1994) concludes that for FM to act as the facilitator of change, there is need for the right balancing act between the organisation, its space and employees. This is because Donald (1994) saw a lack of ability to show a sympathetic response to intrinsic demands -- that is the users' day-to-day demands -- as opposed to the fluency with which extrinsic influences –the organisation's needs -- and the technical aspects of space management were dealt with.

According to the definition of FM adopted by BIFM (2015), FM provides support services to organisations and its main drivers are the goals and policies of those organisations. Deakin, Hudson and Symes (2005) note how, in the private sector, the delivery of shareholder value is shifting towards a 'wider programme of corporate social responsibility'. The traditional 'triple bottom line reporting' is being replaced by broader environmental, economic and social measures (Elkington, 1999). Thus, as policies of social corporate responsibility are increasingly adopted by organisations, FM within the organisations will need to support the sustainability goals of the organisation (Deakin, Hudson and Symes, 2005). As the organisation as a whole sets the course of its progress towards sustainability, using key performance indicators, the FM practice will need to set its own performance targets in support of those of the organisation. Facilities Managers will thus need to be able to understand, and to demonstrate, that they can contribute to the attainment and maintenance of the organisation's sustainability agenda.

ii. *Managing People*

As a service industry, FM can be labour-intensive with complex outsourcing contracts and thus requiring the consideration of the social dimension of

sustainability (Deakin, Hudson and Symes, 2005). The Facilities Manager should work to develop and implement ethical employment policies practices and to allow for the proper training of the human resources with regards to issues of sustainability.

Moreover, conflict management may fall in the scope of FM where individuals and groups compete for resources within the organisations or conflict arises between the users and corporate policy (Deakin, Hudson and Symes, 2005). In this context, the contribution of FM through the concept of organisational justice has been discussed. Conflicts relating to the more sustainable use and operation of the facility may also arise between the users and the technology of the facility.

The Facilities Manager is also responsible for the well-being of facility users with regards to health and safety through the promotion of compliance with the regulations of the local authorities in terms of fire safety, lift, pollution and many other requirements (Langston and Lauge-Kristensen, 2002).

The practice of outsourcing in FM can lead to complex supply chains and the Facilities Manager should create and apply policies for the 'ethical treatment of suppliers'.

iii. Managing Premises

The BIFM includes property portfolio management, understanding building design and building fabric maintenance within the key management area of managing premises. Gibson (1991) describes property as a significant resource of any organisation and argues that the management of property assets is essential for institutions to maximise the achievement of their objectives. The changing trends in property management highlight the rising demands of facility users in terms of quality of the built facility. This results in the need to recognise and maintain the value of a property (Cloete, 2002). Curwell and Cooper (1998) establish that the longevity of the majority of buildings and city infrastructure ranges from sixty to a hundred years or more as opposed to the finishes, fittings, and services which

have a cycle of seven to ten years thus making FM a fundamental part of property management (Finch, 1992).

The issue of environmental risk in organisations primarily arises from the fact that business or facility operations contribute to the deterioration of the environment (Alexander, 1992). However, Alexander and Brown (2006) argue for the usefulness of FM, throughout the life cycle of the facilities, in attaining sustainability by minimising the deterioration of the surrounding physical environment. Alexander (1992) argues that the recognition of the broad environmental concerns by organisations can be achieved through promoting consumer consciousness and value management techniques. Elmualim *et al.* (2010) address the need for better strategic planning with regards to the environmental challenges that buildings will face in the long run. An effective maintenance plan with the right balance between reactive and preventative maintenance will be key to the building fabric maintenance (Chanter and Swallow, 1996; Wordsworth, 2001). The importance of a planned preventative maintenance programme in reducing energy use and increasing the lifespan of fabric and service in buildings has been highlighted by Keeping and Shiers (1996) and minimising energy consumption and waste through increasing awareness of facility users on environmental impact have pointed out by Elmualim *et al.* (2010). Keeping and Shiers (1996) argue that fabric maintenance will continuously provide opportunities for meeting the sustainability agenda through upgrades and the move towards materials and components that are environmental friendly.

Deakin, Hudson and Symes (2005) state that the management of premises also comports an important social element. Thus, the necessary measures need to be taken to ensure accessibility of all potential users by catering to any disability factors which may affect mobility. The duties of the Facilities Manager while managing premises also include planning to minimise adverse local effects such as local pollution, unsociable operating hours, noise levels, visual intrusion, traffic generation and other factors which may affect the surroundings of the facility. The adverse effect of local traffic generated through public transport and private car

use is highlighted by Dabson (2000) who shows the imperativeness of effective policies in that regard.

iv. Managing Services

Besides the provision of building fabric maintenance, FM provides a wide range of other support services which may vary from organisation to organisation. Since upgrading of services work on a much shorter cycle than the building structure, within the life-cycle of a facility, building services management is an area in which FM can have a significant effect on sustainability. The impact of FM will range from the energy-efficient use of existing systems, prevention of environmental health problems such as Legionnaire's disease to provision of a comfortable working environment. This will be achieved through the provision of FM services such as cleaning and catering, reception and office management, security, waste management and grounds maintenance

According to van Wagenberg (1997), Quality FM was first addressed by Friday and Cotts (1995) as a concept that stems from good leadership of a proper organisation. Quality Management is a technique used for monitoring the quality of services by ensuring that facilities are managed with the aim of attaining the organisation's goals and the reduction of business risks (Alexander, 1996). To improve the quality of business operations Alexander (2003) argues that the balance between the objectives of the organisation and the services provided by the facility requires the implementation of collaborative strategic processes. Alexander (1996) also highlights how effective teamwork majorly impacts on quality standards and the customer satisfaction and how good communication is, consequentially, another fundamental concern related to the efficient flow of information.

v. Managing the Working Environment

The concept of FM is based on the link that exists between an organisation and the physical environment within which it operates and how the maintenance and

improvement of the surrounding environment will allow for better efficiency in the facility (Amaratunga and Baldry, 2000). Amaratunga and Baldry (2002) also mention that a prerequisite to effective FM is the performance measurement of the FM approach and how the building is aligned with the objectives of the occupants. Indeed this is in line with value maintenance management, as described by Khamidi *et al.* (2010), which is characterised more by the need of the users than by affordability and physical conditions of the facility. Thus, Kincaid (1994a) and Douglas (1996) claim that performance measurement and management of a facility, based on Key Performance Indicators (KPI's), is crucial, specifically where benchmarking is required for strategic development. However, Barrett and Baldry (2003) caution that unreliable building performance measures contribute to poor decisions and emphasise that key issues that can have a negative impact on the performance of the facility must be identified.

According to McGregor (1994), understanding FM can only be accomplished through the consideration of the relationship between the physical resource, infrastructural support and the users of the facility. In this regard, McGregor and Then (1999:15) define FM as "*the infrastructure that supports the people in the organization in their endeavours to achieve business goals".* McLennan (2004) acknowledges FM as a 'service management' tool and outlines a conceptual framework of Service FM that links the different sectors of FM to enable the management of space and infrastructure that supports services. Jensen (2008) also believes that FM should be used as a tool for service administration through the assistance of a service manager possessing the required professionalism to integrate the operational, tactical and strategic aspects of FM with the specific 'service functions' to ultimately achieve the goals of the organisation.

Although the BIFM divides management of the working environment into two sections, i.e., environmental issues and space management, Deakin, Hudson and Symes (2005) argue that the environmental and social issues should not be compartmentalised but rather understood as an integral part of the professional practice. McGregor and Then (1999) argue that space management has a big impact on the quality of working life of building users and the effectiveness of an

organisation through enhanced productivity and reduced workplace stress. Alexander (1992) also states that the mission of FM is to provide continuous improvement tothe quality of operating environments. Amaratunga *et al.* (2000) note that there has also been a steady change in the 'facilities environment' to follow evolving trends. In addition, Amaratunga *et al.* (2000) support the need for a change to the entire FM concept so that facilities can meet the demands of organisations.

vi. Procurement and Resource Management

Besides the four primary resource trails identified by Nutt (2000) and which form an essential part of property and facility management, being central concerns of corporate strategy and business operations, Nutt (2004b) identifies two supplementary sets of resources which are critical to business success. These are infrastructure services and intangibles i.e. qualitative assets such as brand loyalty and other elements making up the goodwill of the organisation. Nutt (2004b) states that, both at national and local level, the main purpose of infrastructure, property and services is to support and sustain business and public endeavours of all kinds and across all sectors. Thus, Edwards (2004) states that resource management is a key tool to improving the procurement of more sustainable FM services. Since FM is characterised by complex outsourcing relationships, it is critical to promote sustainability within the supply chain (Edwards, 2004).

The basic resource platform is shown in **Figure 8** where the elements and stages of the resource management process are shown at the top. It thus provides an understanding of which parts of the resource process should be managed by which team including the FM team and which parts might be in-house, part-sourced, or outsourced (Nutt, 2004b).

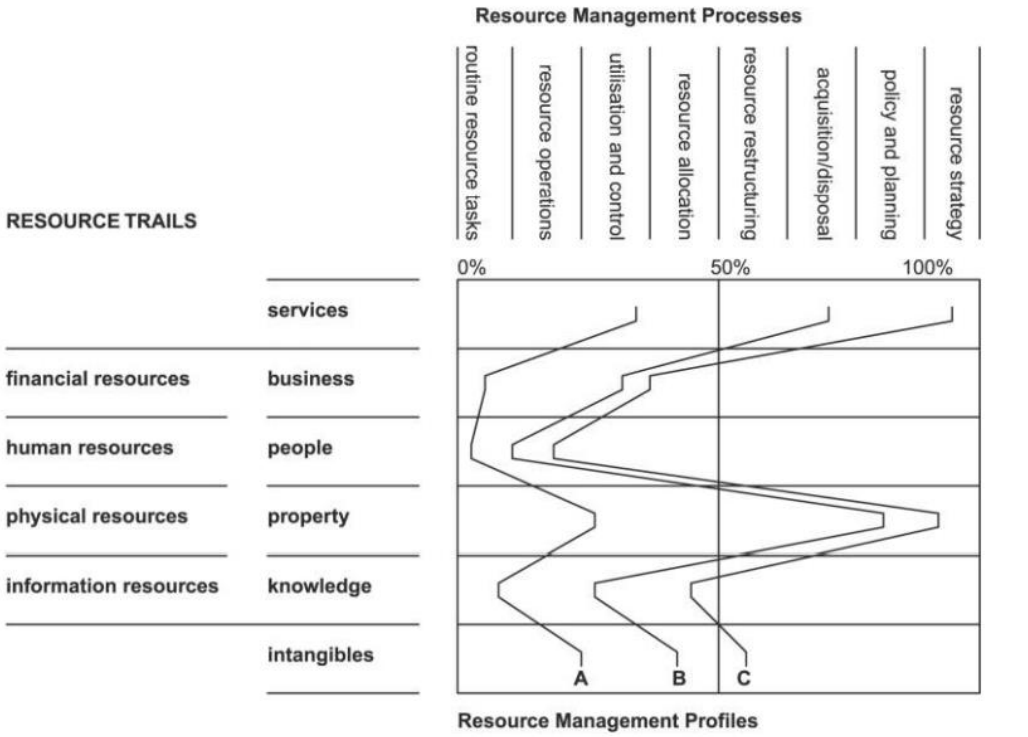


Figure 8: The Resources Platform

Source: Nutt (2004b:337)

Edwards (2004) broadly defines procurement in terms of the harnessing of the necessary goods and services to ensure effective operations of a building or an infrastructure thoughout its life cycle and which reconciles the theoretical aspirations of policies with the actual needs of the whole operation. Thus, procurement and evaluation, as a pair, form a continuous cycle through which the producst and infrastructures of the built environement are assessed and readjusted and adapted at the detection of any shortcomings. Thus, sustainability criteria should be stated in the client briefing, specifications and the development of service-level agreements through setting KPI's, for example and continuous benchmarking against targets must be done.

2.4 Understanding Urban FM

2.4.1 Emergence and Drivers of Urban FM

Contemporary urban environments require evolving configurations of the complex relationship between private and public interests that underpin all cities (Melvin, 1992). This realignment of public and private interests in the urban domain has seen the simultaneous development of FM as an identifiable practice in the last few decades. Thus, Melvin (1992) sees the evolution of FM as a positive means of managing a part of the physical environment where more traditional means of management have failed.

Larsen *et al.* (2011:86) propose that unlike the previous approaches of FM which were driven by an emphasis on business, social drivers be emphasised, leading to the considerations of FM as "the science and practice of dealing with people, places, and societies". In this same vein emerged the socially oriented concept of community-based FM (Alexander and Brown, 2006; Michell, 2010) which argues for a better understanding of socially constructed reality of urban space. The latter relates to the relationship between space, place, people and technology and the interaction of users of urban precincts and the facilities themselves (Michell *et al.,* 2016). This echoes Kasim and Hudson (2006) who had earlier proposed one multi-disciplinary approach of FM where the social and financial aspects of the practice come together; thus, involving not only the management of the organisation's core business, but also the delivery of quality services to the users.

Similarly, Alexander and Brown (2006:251) argue that, to strengthen its position and maintain its influence, FM as a practice must be able to respond to the contemporary concerns of 'regionalism and locality, economic and community regeneration, environmental quality and sustainable development, and social inclusion'. Indeed, Larsen *et al.* (2011:84) state that the 'perspective of FM has undergone an epistemological urbanisation'; a move born through Alexander and Brown (2006) who have pushed the limits of traditional FM enterprise into the domain of urban development.

Larsen *et al.* (2011) maintain that, as FM has been morphing, in the recent years, to accommodate the changes in the economy, FM has been embracing the broader social issues of the surrounding city and community. By introducing this new concept, Alexander and Brown (2006) argue that, FM will be central to the existing urban policy schemes. Larsen *et al*. (2011) state through the introduction of these urban policy schemes, communities can not only be viewed as productive areas but as new, untapped sources of economic development.
As a starting point, Alexander (1992) argues that the effective implementation of FM will require the identification of the differences in the organisation's objectives its culture and its management style. Alexander (1992) debates that the main difference between private sector organisations and public sector companies lies within their objectives and as such, there is a need to distinguish between the different types of organisations, their corporate behaviours and driving objectives. Private organisations, for instance, are mostly profit-maximising with strategic decisions internally. In contrast, the strategic decisions of public organisations are taken externally through political processes and their tasks are geared towards a more social and supportive approach (Boyd and Chinyio, 2006).

FM provides additional potential value, by providing considerations for social and environmental needs as well as increasing the economic viability of development (Alexander and Brown, 2006). Alexander (2006) citing Price (2002) argues that although these additional benefits have been increasingly recognised by investors, developers, designers, occupiers, public authorities and everyday users, they must also be expanded to encompass the community and society.

Breed (2008:215) sets forth that in contemporary western ideology, the production of urban space – including 'ideas of city, civic and public life -- is directed by politics; in the form of urban actors who operate inside the social structures. The interests, needs and diverse contexts of the urban actors, according to Breed (2008), are decisive in the make-up of the urban environment. Likewise, Scott and Storper (2005) point out how the urban land nexus, which is the an extensive pool of common assets and liabilities, is vulnerable to becoming dysfunctional

through breakdowns of infrastructure, counterproductive land use, degeneration of neighbourhoods and environmental pollution, in the absence of effective institutions of collective coordination. Thus, Scott and Storper (2005) behoove able institutions to implement appropriate planning and policies to counter these dysfunctionalities which would undermine the viability and efficiency of urban existence. This is because market logic is effectively incapable of regulating the urban commons in the interests of economic efficiency and social wellbeing (Scott and Storper, 2005). This concurs with Roberts's (2004) suggestion that the main issue underlying Urban FM relates to the public interest within private ownership and management of public assets.

Roberts (2004:349) introduces the notion of Urban FM as "the idea that community management can be wholly externalised to professional service providers, responsible for investment and management of the public infrastructure and its associated services." Urban FM is thus seen as a mechanism for developing a sustainable framework for managing and operating public facilities (Tobi, Amaratunga and Noor, 2013). It is based on the concept of outsourcing provision of public services in order to tap into the knowledge pool of the private sector FM experience. Roberts' (2004) perspective of Urban FM was to realign FM to the public interest and stakeholder value by presenting Urban FM as a solutions provider for the public services sector through improved efficiency in the provision of public services, greater level of services, and customer oriented public services. Roberts (2004) blurs the lines between the core and non-core activities of an organisation in so far as private sector involvement in community service provision is concerned. The test is simply one of efficiency and quality through the application of new technology and service innovation. Roberts (2004) further suggests that through the integration of public service and community support, a significant contribution to the principle of putting people first and meeting best value objectives could be made.

Curcio (2006:1) defines Urban FM as 'an integrated approach to the management of urban facilities to maintain/increase the specific levels of quality of the same facilities and the global level of quality of the whole city'.

Speaking in the Italian context, Curcio (2006) argues that dysfunctions are evident in the illogical and subpar delivery of services on the urban facilities in the cities. Thus, Curcio (2006) argues that the public work order sector must recognise the pressing need for the definition of the tasks and functions of the control room, considering the intrinsic complexity of the planning and coordination processes of Urban FM activity.

This concern is also raised, more generally, by Jolicoeur and Barrett (2004) who observe the overspending by government and the failure to attain the objectives of the local government. Thus, Jolicoeur and Barrett (2004) highlight the importance of strategic asset management in the public sector in the running of public sector properties. In this context, Jensen and Due (2008) present an FM model well suited for organisations dealing with municipalities. The model, shown in **Figure 9** below, makes the distinction between the strategic, tactical and operational perspectives. Each level comports a customer forum, organised to ascertain that political intents are aligned with the changing needs and demands of the citizens.

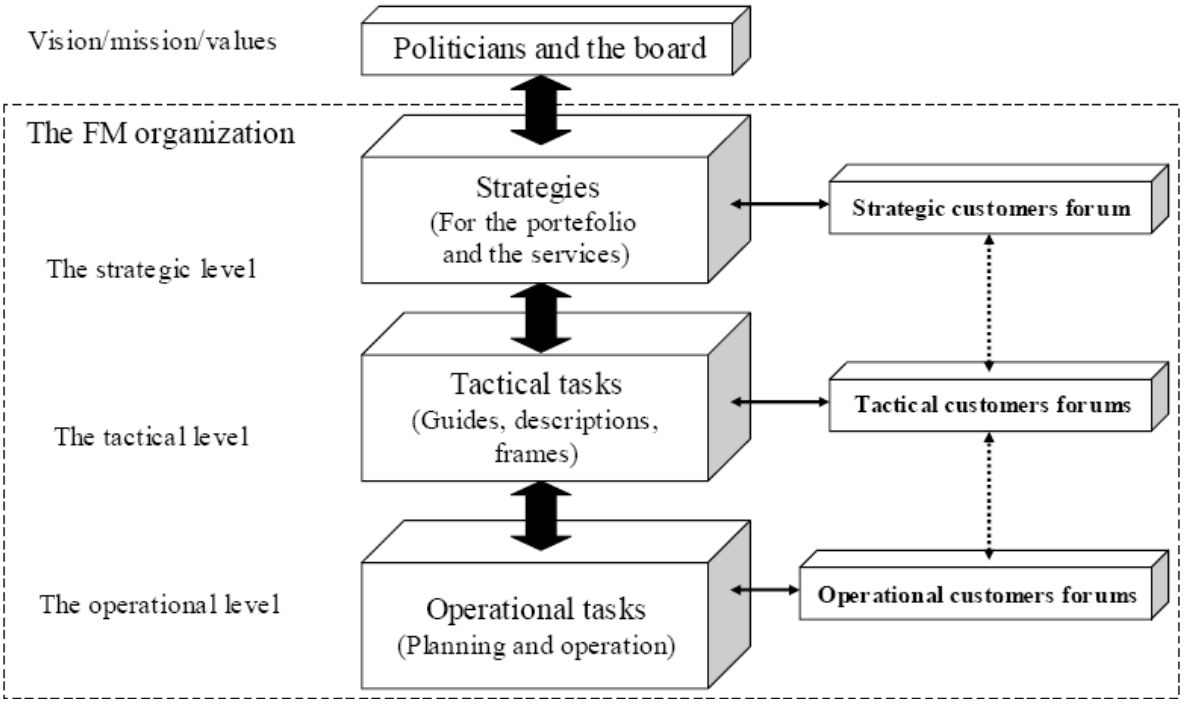


Figure 9: The FM Organisation

Source: Jensen and Due (2008:399)

Prior to the development of this model by Jensen and Due (2008), the latter expound on the definition of FM by the European Standards (2006) under EN 15221. Thus, they highlight the strong distinction made in the FM literature between the strategic, tactical and operational strata. The literature from Alexander (1996), Nutt (2000), Barett (2000) and Langston and Lauge-Kristensen (2002) discussed above is in line with this observation of Jensen and Due (2008). Discussing a model of FM annexed in the EN 15221, Jensen and Due (2008) explain that this distinction, with the strata labelled as levels of interaction, is a founding element. This model from the EN 15221 is shown in **Figure 10**. Thus, the strategic level works on the long term towards the achievement of the organisation's objectives. The tactical level allows for the implementation of the strategic objectives in the organisation in the medium term and the day-to-day requirements of the end uses should be met at the operational level (CEN, 2006: Jensen and Due, 2008).

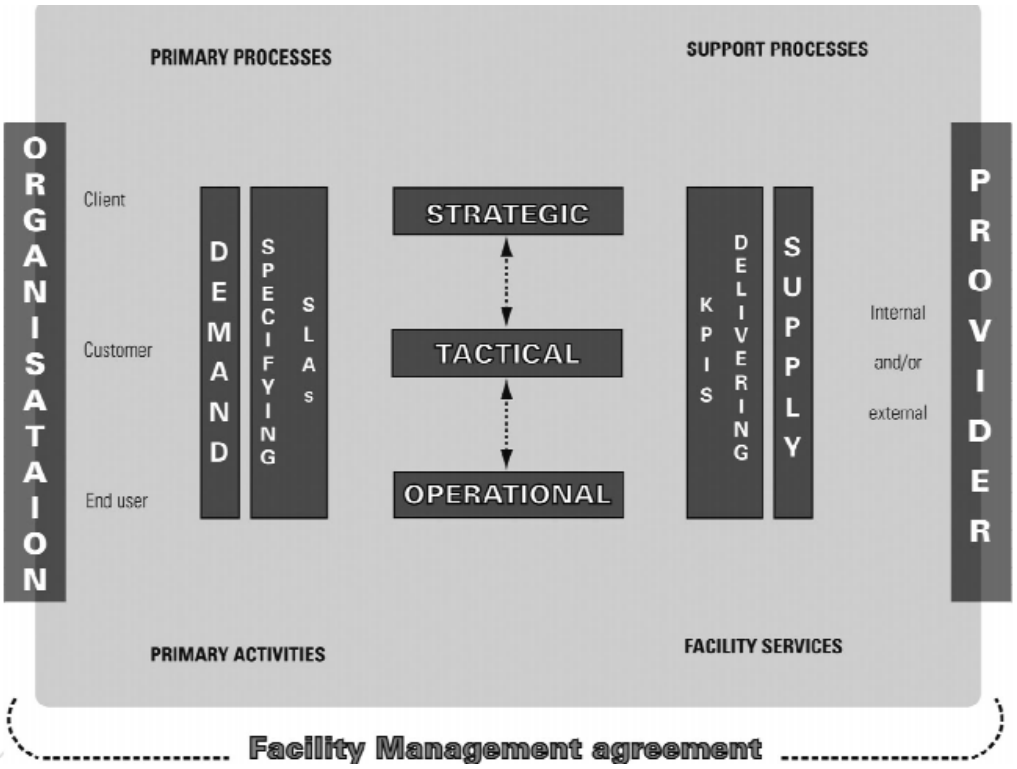


Figure 10: An FM Model

EN 15221-1:2006 (E) – Annex A:8

Curcio (2006) argues that, although urban systems are complex structures with simulateneously diverging and converging connections, many companies working

in the management of public works or single fragment service have an obsolete structural and organisational set-up which is inadequate for the coordinated running of integrated Urban FM services. On the other hand, he observes that there are only a limited number of specialised national and multinational companies which operate exclusively in the FM or as Global Service providers. This is claimed to be due to the lack of provision of systematic planning and diffusion of education specifically oriented towards the creation of technical and professional competencies that are specifically aimed at the management of Urban FM services.

Curcio's (2006)observations echo Roberts (2004) who also highlights that if FM wishes to overcome its challenges in the public sector realm, it needs to shift from the traditional models and look for new approaches based on public interest. This is further emphasised by Tobi, Amaratunga and Noor (2013) who state that there is need to move away from the traditional service provider approach to help local communities in decreasing the costs of managing, operating, and sustaining their public facilities.

2.4.2 Urban FM: a Multi-Disciplinary Approach

The definition of FM according to the International Facility Management Association (IFMA, 2016) is a multi-disciplinary profession ensuring functionality of the built environment through the integration of people, place, process, and technology. This definition clearly illustrates the holistic nature of the discipline and the interdependence of multiple factors in its success (Badger and Garvin, 2007). BIFM (2015) concurs with this idea that FM embraces activities within multiple disciplines in the built environment and the management of the impact these activities upon people and the workplace.

Michell (2013) argues that, besides FM, Urban FM overlaps a number of fields such as urban development, urban management and urban sustainability. Indeed, De Toni and Nonino (2009:1103) describe a new model in the FM discipline termed Open Facility Management which would be presented as a

"multidisciplinary approach for the integrated and coordinated design, planning and management of non-core services."

Urban FM and Urban Governance

UN-Habitat (2015:1) defines Urban Governance as "*the sum of the many ways individuals and institutions, public and private, plan and manage the common affairs of the city*". It is a continuing process which includes formal institutions, informal arrangements and the citizens and allows for the accommodation of conflicting or diverse interests and supports cooperative action. Thus, Symes, Deakin and Curwell (2005) show how, in its descriptive sense, the term governance is made up of different bodies, interests, service delivery systems and regulatory structures which are involved in policy and decision making. Under its standard definition, on the other hand, governance is simply a model for managing collective affairs which according to Jessop (2000:15) and Rhodes (1997:8). is a 'horizontal self-organisation among mutually interdependent actors' (), of which government is only one and with only imperfect control Abbott (2012) argues that governance is part and parcel of the development process and ultimately, its objective is the creation of a sustainable urban infrastructure base that can provide the foundation for ongoing development.

In recognition of how good governance generates positive development outcomes, UN-HABITAT (2015) is currently developing and testing an index, Urban Governance Index, to measure the quality of urban governance. Thus, at global level, the index will be used to demonstrate the importance of good urban governance in achieving broad development objectives and, through the process of comparison, the index will instigate specific actions to improve the quality of local governance

However, Abbott (2012) , argues that development is not only about targets and that it is a reflection of the nature of community and the roles of government, that of the individual and the state in society, and that of the private sector in society.

Larsen *et al.* (2011) state that, in recent years, the world has seen much development, resulting in creative industries in which the issues of culture and economy are interrelated to form a new bond. Larsen *et al.* (2011) further argue that this is due to the shift from traditional and technical governances to more social governance where there is more public management. Nonetheless, Kauko (2012) argues that there is need for support from the private sector for good community governance. He says that setting smart policies, regulations and incentives at the local and regional levels are essential to meet sustainability goals.

Abbott (2012) states that infrastructure should be seen as a basis for African development and recognises that urban infrastructure has been at the heart of international debate on urban development in Africa. Abbott (2012) blames the failure to create a viable and sustainable infrastructure model for African cities on the rapid urban growth, the downfall of the colonial urban model of government, and a breakdown of urban structures of control. Abbott (2012) further elaborates that infrastructure is about far more than technology and the physical manifestation but is an integral part of the social and cultural framework of an urban society through the interdependent relationship that exists between infrastructure, the urban social construct, and the physical environment. Moreover, he stresses that there is need is for a new infrastructure model firmly anchored in the sustainability principles. He believesthat the minimally urbanised Sub-Saharan Africa, and African towns and cities generally, with their low installed infrastructure base, would provide a ripe platform to help define this new model.

Urban Planning and Urban FM

Davoudi (2005) states that all societies, except for the simplest ones, rely on some forms of planning to allow for the management of space with some degree of proactiveness. This is often achieved through mechanisms such as the regulation of land use and development, the control of property rights, and the provision of urban services which would result in a definite impact on cities' economic, social

and environmental dynamics. Stenberg (2008) notes that new planning theories and approaches are being developed as the prerequisites for planning have changed with the introduction of the sustainable development concept which has become the ultimate goal for planning practices (Adams *et al.*, 2005). Kauko (2012) argues that, while the three dimensions of sustainability -- in the form of its environmental, economic and social aspects -- are sufficiently general to include more specific issues such as transportation systems amongst others, the notion of how to achieve the goals of sustainability is still, however, rather vague. Kauko (2012:2060) believes that this especially concerns the hitherto neglected social dimension of sustainable development which includes, among others, 'aspects of participation, social life and stigmatisation'. Davoudi (2005) maintains that, although their primary concern remain the development and use of land, planning activities may be reinforce or complement other disciplines of public policy.. In fact, Davoudi (2005) sees the role of planners as coordinators helping in the mediation of negotiations, enhancement of collaboration and empowerment of different voices. This link-making potential of urban planning can be exploited to facilitate governance and the transformation of government to governance.

Sellers (2002:93) argues that the multiple local jurisdictions within an urban region that typically divide up the urban space often face common problems and must often work collectively and in coordination. Thus, urban and regional planning has emerged as one of the most important solution in the advanced industrialised parts of the world. Indeed, Breheny (1996) highlights the importance of regional planning which relates to the need towiden the economic, social and physical scopes of any local urban area so as to promote survey and planning to a city region scale.

In conclusion, FM, as a support service to an organisation's primary activities (Kincaid, 1994b), can be said to be a multi-disciplinary area that focuses on managing and providing quality services to end users as indicated by Kasim and Hudson (2006). According to Grimshaw (1999), these multiple facets arise from the fact that each stakeholder who deals with the discipline holds different but to their mind, equally correct version of the truth. This indicates that the FM model needs to cater for the demands of multi-stakeholders (Kasim and Hudson, 2006).

Thus, Heywood and Smith (2006) argue that a better FM service will be achieved through the communication and interaction with stakeholders to close the gap between their needs and expectations. This must be done while keeping in mind that despite the relevance of FM to organisations of any sector and both to economically developed and developing countries, the need to identify differences in context is crucial to effectively deliver the required operating environment and services (Alexander, 1992).

2.4.3 Managing the Urban Precinct as the 'Facility'

In its classical role and definition, FM serves individual organisations rather than all the users of and visitors to an urban zone. Melvin (1992:14) questions whether FM can propose to help 'fill the gap in urban management left by the decline of urban government' through an application at a macro level. Melvin (1992) however cautions that it is unwise to think that the framework provided traditionally by the FM practice could be transferred directly. He argues that FM generally deals with problems which are 'discrete', i.e., related to the aims of a single organisation, and the occupation of a single building. Thus, in its orthodox practice, FM would traditionally need to align itself to the aims and objectives of one single organisation and any lack of clarity in the business plan of the organisation would reflect in the delivery and quality of the FM services. In this sense, Melvin (1992) defends FM against any accountability to the public in a political and democratic sense.

Although Larsen *et al.* (2011) draws the parallel between neighbourhoods and offices, and points out how we have seen a development where cities increasingly act like corporations in their strategic planning at the same time as the theme of urban quality is playing a larger role in such a way that corporations have become urbanised, Melvin (1992) cautions that the problems encountered in creating an urban area are of a much larger scale than those met in creating a single building. In the latter case, the boundary between public and private zones is neatly delimited by the perimeter of the building, whereas

in the former, conflict between various users and visitors is almost inevitable resulting in an interlacement of patterns of use. Scott and Storper (2015) argue that although urban land is divided into units of land that can be individually bartered and owned, the urban land nexus is very much more than the simple sum of standard-alone private parcels of land. Units of urban land, in the form of individual intra-urban locations or entire neighbourhoods and districts which are serviced by infrastructure, are interdependent and reflect the many 'individual', 'communal' and 'political' pressures which shape them (Scott and Storper, 2015:19).

Lefebvre (Merrifield, 2006:174) defines three different dimensions of space in terms of 'mental', 'physical' and 'social'. Thus, to create a unity in the production of the urban environment, there are three essential criteria that need to be incorporated. Firstly, spatial practices in the form of how the space is organised and used; secondly, the representation of the space as configured by the designers and architects and; lastly, the symbolic space which comes from the perception of the user.

Nevertheless, Melvin (1992) argues that there may still be elements of FM which could, in conjunction with other managerial techniques, be used to run urban environments to suit contemporary conditions. Kincaid (1994b:21) predicts that as FM matured as a professional practice, the scope for practitioners would extend beyond buildings to such infrastructure fields as 'transport, utilities and whole urban areas'. FM professionals who are responsible for major mixed use sites with many buildings are already playing this role (Kincaid, 1994b). Melvin (1992) takes the example of urban developments such as Broadgate or Canary Wharf in London where these issues were already being addressed. He points out how, in those developments, their very scale makes the division between public and private and visitor and user almost impossible to define. Melvin (1992) addresses the degree of detail that has gone into the conception on all levels; from transport access, urban to detailed design and maintenance and argues how reaching

beyond questions of construction and final appearance, these aspects could be related to FM. Apart from the size, similar issues were faced by the other contemporaneous developers. Thus, the ability of the infrastructure to support the influx of people and to cater to their technological and physical needs were as crucial to the development's success as the architectural features or the ratio of lettable space (Melvin, 1992). Indeed, all these factors were interdependent and could not be treated in isolation from the others. Taking Canary Wharf as an example but extrapolating to the general, such a development has to encapsulate the characteristics of an urban neighbourhood, from the mundane drainage functions to the IT infrastructure. Thus, for a development of such size i.e. 14,000,000 square feet, the emphasis was laid on the flexibility of the infrastructure so that tenants could adapt and build systems within their individual office space. This finds echo in Kincaid (2000) who advocates that the sustainability of cities will be further helped by allowing for redundancy and flexibility in design so as to better incorporate unpredictable future technologies. Melvin (1992:16) concludes that 'the success of the synthesis, rather than the individual parts', would attest to the success of the development.

Breheny (1996) suggests that the creation or re-creation of small, intimate neighbourhoods, from new urban villages or free-standing new settlements in the UK or equivalent neo-traditionalist developments in the United States, is partly lending to the renewed interest in community-level solutions. To promote social and community development, Michell (2010) notes the movement of FM from the micro level focus on the building to the macro level focus on the urban precinct and its cause being the need to changing current FM policies so as to help the integration of public services and community support services as advocated by Roberts (2004).

2.5 Concluding Thoughts

This chapter started out by reviewing the literature on sustainability and, through the examination of urban theory, attempted to understand the

sustainable urban precinct. The literature then portrayed the theory of FM and its components in broad aspects. It then outlined the emergence of Urban FM, its drivers and objectives. The need for FM to undergo a transformation from its traditional domain in order to cater for the social concerns and interests of the population was thus identified. This led to the development of the concept of Urban FM. From there, the literature concerning the application of FM at the precinct level was examined. Thus, from the literature review, it can be recognised that there is potential for research to be done on the principles of FM being extrapolated from its application at the level of one organisation to a whole urban precinct. In the local context, since urban precincts exist, their management provides grounds for further research in this field in order to create an informed contextualised implementation of FM principles at the precinct level.

This research leans on studying and analysing data gathered in the case study. Hence, the following chapter will focus on the appropriate ways of gathering data when using a case study and the associated implications and limitations for this research.

CHAPTER THREE: RESEARCH PHILOSOPHY AND OVERARCHING METHODOLOGY

3.1 Introduction

The purpose of this chapter is to outline the research methodology employed and to justify the research methods chosen based on the literature available on data collection techniques and its suitability to the research. A list of questions as used during the focus group interactions and the interviews is provided together with the whole data collection procedure adopted. The chapter then ends with the data analysis method to enable the interpretation of the findings. Marczyk *et al.* (2005:1) describe research as 'the primary tool used in virtually all areas of science to expand the frontiers of knowledge' in the same vein as Guillemin and Gillam (2004) who refer to research as being primarily an undertaking to building knowledge. Thus, the researcher and the participants are engaged in knowledge production (Guillemin and Gillam, 2004). Crotty (1998) points out that the choice of the methods and methodologies is determined by the purposes of the research i.e. by the research question that the research inquiry seeks to answer. Guillemin and Gillam (2004:274) state that this is an active process where the data, the researcher, the participants, in their underlying context must undergo close 'scrutiny, reflection, and interrogation'. In consequence, for Harwell (2011), research design plays an important role in any study, irrespective of qualitative, quantitative or mixed methods.

3.2 Conceptual Framework: Epistemology, Theoretical Perspectives, Methodology and Methods

3.2.1 Philosophical Discussion

Crotty (1998) argues that when developing a research proposal, the researcher needs to determine the methodologies and methods to be employed and provide the justification for the choice and use of these methodologies and methods.

Crotty (1998) further notes that, as the researcher approaches the research question arising from a real-life issue that needs to be addressed, the aim and the objectives of the research can be defined. Thus, the optimal strategy to achieve these research aims and objectives, incorporating the purposes of the research, leads the researcher to his methodology and methods. In this sense, Crotty (1998:3) defines the *research methods* as the "*techniques or procedures used to gather and analyse data related to some research question or hypothesis*" and the *methodology* as the "*plan of action or process' underpinning the choice and use of particular methods and 'linking them to the desired outcomes*. However, Crotty (1998) argues that the rationale behind the chosen methodology and methods needs to be expounded on to allow for soundness of the research and respect of its outcomes.

Thus, the researcher needs to explain the *theoretical perspective* behind the chosen methodology since it is the 'philosophical stance' supporting and guiding the methodology and thus justifying the process and its logic. The *epistemology,* in turn, informs this theoretical perspective as it is the *"theory of knowledge embedded in the theoretical perspective and thereby in the methodology"* (Crotty, 1998:3). This is shown in **Figure 11**.

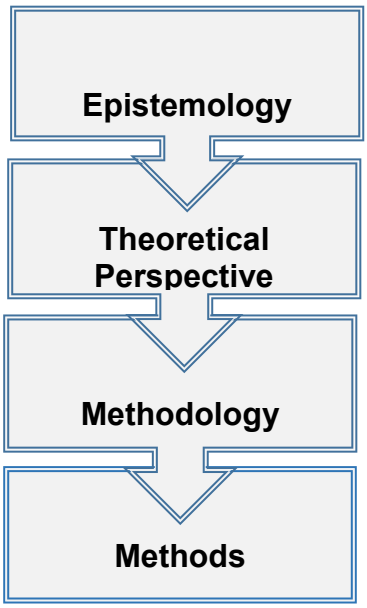


Figure 11: The four elements of research framework

Source: Crotty (1998:4)

Crotty (1998) claims that setting out the research process in terms of these four elements allows for the justification of the methodologies and methods employed. Thus, through a penetrating analysis of the process, the theoretical assumptions underpinning it and, consequentially, the status of its findings are highlighted.

Table 2: Examples of the different elements of research framework

Epistemology	Theoretical Perspective	Methodology	Methods
Objectivism Constructionism Subjectivism (*and their variants)*	Positivism (and post-positivism) Interpretivism • Symbolic interactionism • Phenomenology • Hermeneutics Critical Inquiry Feminism Postmodernism *etc*	Experimental research Survey Research Ethnography Phenomenonological research Grounded theory Heuristic inquiry Action research Discourse analysis Feminist standpoint research *Etc.*	Sampling Measurement and scaling Questionnaire Observation 4 participant 5 non-participant Interview Focus group Case study Life history Narrative Visual ethnographic methods Statistical analysis Data reduction Theme identification Comparative analysis Cognitive mapping Interpretative methods Document analysis Content analysis Conversation analysis *etc.*

Source: Crotty (1998:4)

Epistemological Stances

Hamlyn (1995: 242) defines epistemology as the study of knowledge and deals with 'the nature of knowledge, its possibility, scope and general basis'. According to Gray (2013), epistemology provides a philosophical foundation for deciding what kinds of knowledge are legitimate and adequate. Easterby-Smith, Thorpe and Lowe (2002) state that having an epistemological stand helps to clarify issues of research design and define it by outlining the overarching structure of the research including the kind of evidence that is being gathered, its sources and its interpretation.

Epistemological positions exist such as objectivism, subjectivism, intersubjectivism, and constructivism. *Objectivism* stands by an objective truth that the researcher needs to identify, and can identify, with precision and certitude (Crotty, 1998). Crotty (1998) explains that objectivism is the epistemological stance that 'things exist as *meaningful* entities independently of consciousness and experience, that they have truth and meaning residing in them as objects'.

Gray (2013:20) explains that, in contrast, *constructivism* holds the opposite view of human knowledge. Thus, meaning is constructed by the subject's interactions with the world and not discovered since different subjects build their own meaning of the same phenomenon in different ways. Indeed, Morgan and Smircich (1980) state that a social construction perspective in research promotes the idea that reality stems from the very process of its creation, and possible knowledge is bound to the understanding of that process. Hence, according to Gray (2013), in this epistemological stance, different interpretations of the world may exist and be equally valid although contradictory in nature.

On the other hand, the subjectivist view of reality, which is defined by the individual imagination, would challenge the positivist stance and would seek to understand the world through the interaction of the individual with it (Morgan and Smircich, 1980). Acknowledging and emphasising this interaction, this phenomenologically oriented perspective embraces the biased interpretation of the scientist's experience of the world and rejects the idea of an objective knowledge (Morgan and Smircich, 1980 citing Husserl, 1962).

Theoretical Perspectives

Gray (2013) states that positivism and various strands of interpretivism are the most influential forms of theoretical perspectives available. Positivism searches for explanations of cause and effect and fundamental laws, and generally reduces the 'whole to simplest possible elements in order to facilitate analysis' (Amaratunga *et al.*, 2002:18). Gray (2013) describes positivism as a perspective where reality

consists of what is available to the senses and that the natural and social worlds sharing common principles of logic and methodology anchored in facts and not values, revolve within a rigid set of laws. According to the positivist stance, these laws should be discovered through empirical inquiry by scientific observation and not philosophical speculation.

On the other end of the spectrum, the interpretive stance, which derives from the constructivist position, does not question ideologies but accepts them (Scotland, 2012). Thus, according to Creswell (2009), interpretive methodologies aim at understanding phenomenon from an individual's perspective, through interaction among individuals and in people's specific historical and cultural contexts. Interpretive methodologies thus include case studies, phenomenology, hermeneutics and ethnography.

3.2.2 Reviewing the Research Question

As pointed out by Crotty (1998), the choice of the research methods and methodologies is determined by the purposes of the research i.e., by the research question that the research inquiry seeks to answer. The research context and the research paradigm are thus briefly revisited before the discussion of the research methodology and data gathering methods.

The Research Context and Research Paradigm

Kuhn (1970:175) describes a paradigm as "the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community". Thus, every paradigm, composed of its particular ontology, epistemology, methodology, and, methods is based upon its own ontological and epistemological assumptions and have differing interpretations of reality and knowledge which underpin their research design and process (Scotland, 2012). This is reflected in their methodology and methods.

FM research to date is predominantly rooted in a positivistic research paradigm centred around environmental determinism with scientific quantitative research as

the chief methodology of FM researchers (Michell, 2010 citing Ratcliffe, 2000; Price *et al.*, 2009; Vischer, 2008: 232). This approach has failed to take into account the 'intrinsic attitudinal, behavioural and sociological aspects' of FM as a science and practice which deals with people, places, and societies (Michell, 2010:72). This is the greater so for Urban FM, taking into consideration the epistemological urbanisation of the FM perspective and the pivoting of the urban studies from a neutral and objective practice with claims to scientific objectivity towards more multifaceted perceptions such as critical realism and epistemological social constructivism (Larsen *et al.*, 2011).

In a management scenario, where the ontological assumption that the world is a concrete structure is relaxed and it is acknowledged that human beings do not simply respond to the social world but actively contribute to its creation, qualitative research would provide the required subjectivity and depth. Although quantitative research is noted for its 'objectivity, rigour and concern with issues of reliability, repeatability, validity and mechanistic efficiency', qualitative research provides a different and richer understanding of the complexities of the social interaction of the participants and their environment within the problem context (Michell, 2010:72). Hence, arises the question as to what research paradigm should guide the research methodology?

To reiterate, the problem context is centred around the management of private and public facilities and spaces at a macro level and its role in supporting multiple, subjective sustainability agendas of different stakeholders in terms of social and local economic developments. The problem is located in a setting where the points of view of individuals and stakeholders influencing or being affected by the management of the precinct are being used as sources of data. Hence, this research adopts a social constructionist, interpretivist framework which informs the application of the case study methodology based on qualitative data collection methods.

3.2.3 Overarching Qualitative Research Methodology

Qualitative research is a type of scientific research which, in general, is an investigation that seeks to answer a question by systematically using a predefined set of procedures collecting evidence and producing findings (Mack *et al*., 2005).

Mack *et al*. (2005) distinguish between quantitative and qualitative data methods through their objectives, the nature of questions asked, the data collection instruments, the type of data which these produce and also the flexibility that is allowed within the analysis. Creswell (2003) states that, through qualitative research, researchers seek to understand the context or setting of the participants by personally visiting this context and gathering information. Consequently, they proceed to an interpretation of their findings which is shaped by their own experiences and backgrounds. This concords with Winter's (2000) statement that qualitative research enquires into the personal experience of individuals, groups and subcultures and the meanings that they generate from this, rejecting the idea of one single truth which is static and completely objective in nature. Thus, Creswell (2003) points out that the process of qualitative research is inductive in nature, where meaning is generated by the researcher from the data collected in the field. This is done in order to address the research problem by answering the research question which is an underlying principle of qualitative research, as highlighted by Chadwick *et al.* (1984).

An important advantage of qualitative data collection methods over quantitative ones is their flexibility (Mack *et al.*, 2005). Whereas quantitative methods use surveys and pre-set questionnaires which may allow for good comparison but prohibits diversity, qualitative methods, on the other hand, offer higher flexibility and spontaneity and allow a more casual interaction between the researchers and participants (Mack *et al*., 2005). Qualitative research methods allow researchers to approach each participant with tailor made interview questions which are adapted over the very course of the interview. In this sense, the data gathered offer higher clarity to research question itself (Mack *et al.*, 2005).

The qualitative researcher should seek convergence and corroboration through the use of different data sources and by using a minimum of two sources of evidence. The three most common qualitative research methods, according to Mack *et al.* (2005) are participant observation, in-depth interviews, and focus groups. Yin (1994) also include sources such as non-participant observation, and physical artefacts and O'Neil Green (2008) also enumerate primary documents observation notes, memos, internal organisational reports and diaries and the documentary evidence such as emails, journals and newspapers.

Amaratunga *et al.* (2002) highlight another feature of qualitative data which is their vividness, richness and holism, with strong potential for revealing complexity in a real life context. The qualitative methodology has often been advocated as the best strategy for discovery, exploring a new area, developing hypotheses (Amaratunga *et al.*, 2002). It will therefore provide a more holistic approach to the context of Urban FM based on the opinions obtained from the people enquired.

Validity in Qualitative Research

According to Miller (2008), a broad description of validity is the degree to which a study actually measures what it purports to measure. In the positivist/post-positivist tradition, validity is used as an essential indicator of research quality along with—and inextricably related to—notions of reliability, objectivity, and generalisability (Miller, 2008). From the positivist perspective, validity resides amongst, and stems from, other empirical conceptions such as universal lawsobjectivity and truth,deduction and reasoning, factual, empirical and mathematical data (Winter, 2000).

Schutt (2009) states that no set standards exist for evaluating the validity, or authenticity, of the findings of a qualitative study, but this does not negate the need to carefully consider the evidence and methods on which conclusions are based. Miller (2008) states that, in the qualitative field, it would be overly simplistic and inaccurate to look for global qualitative criteria for validity because the type of validity that is sought would be dictated by the purposes and methods of each

qualitative study. Indeed, this reflects Winter (2000) who states that no standardised or accepted tests exist within qualitative research, unlike quantitative research, and the case may be that the nature of the investigation is influenced and adapted by the research itself. Indeed, there may not be any hypothesis or even any findings as such and instead the validity of the research resides with the appropriateness of the research participants and process and its purposes.

In fact, according to Miller (2008), some qualitative researchers who believe that such efforts counter the very essence of subjective interpretive work discard attempts to demonstrate validity altogether. There are, however, some validity-related commonalities in qualitative research such as the vernacular terms *goodness* or *soundness* which have been described by Lincoln and Guba (1985) as appropriate qualitative alternatives to the quantitative goals of validity, reliability, objectivity, and generalizability (Miller, 2008). Notions such as 'trustworthiness, credibility, authenticity, transferability, and plausibility' are often considered as corresponding criteria for good research (Miller, 2008:909). Indeed, according to Miller (2008), this stand eliminates the temptation to measure up qualitative research against inappropriate quantitative benchmarks of validity benchmarks and maintains the view that qualitative research can support thorough and meaningful inquiry within contexts which are dynamic and continually questioned. Throughout the course of a study, researchers can increase these criteria of trustworthiness, credibility, authenticity, transferability, and plausibility as mentioned above by continually double checking findings and auditing their sources, self questioning, brainstorming with peers and benchmarking against existing theory, negative case analysis and sampling sufficiency (Miller, 2008).

3.2.4 Research Methodology: Case Study Justification

The research methodology is the strategy or plan of action which lies behind the choice and use of particular methods (Crotty, 1998:3). Research strategy should be chosen as a function of the research situation (Yin, 1994; Amaratunga *et al.*,

2002). Thus, each strategy, with its specific approach to collect and analyse empirical data, has its own advantages and disadvantages.

The nature of the research problem determines the method to employ, the actual suitability of which derives from the nature of the social phenomena to be explored (Morgan and Smircich, 1980; Noor, 2008).

Definition of a Case Study

Yin (2009:14) defines the case study as "an empirical enquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident". Baxter and Jack (2008) advocate the use of the qualitative case study as an approach to research that facilitates exploration of a phenomenon within its context using a variety of data sources. Thus, this allows for exploration of the issue through a variety of lenses to understand and reveal the multiple facets of the phenomenon. Miles and Huberman (1994) describe the case, which they term as the unit of analysis as some phenomenon occurring in a bounded context and Blatter (2008:68) defines a case study as "*a research approach in which one or a few instances of a phenomenon are studied in depth*".

Njie and Asimira (2014) explain that there are two main views of the case study methodology; one proposed by Stake (1995) and the second by Yin (2003, 2006). Both endeavour to ensure a thorough exploration of the topic of interest and the essence of the phenomenon is revealed but with different methods (Njie and Asimira, 2014). Both Stake (1995) and Yin (2003) base their approaches on a constructivist paradigm where the importance of the subjective human creation of meaning is recognised, but where some notion of objectivity is not completely rejected (Njie and Asimira, 2014).

According to Yin (2003) a case study design should be considered when the research problem entails answering "how" and "why" questions; when one cannot manipulate the behaviour of those involved in the study; when the aim is to dig into

contextual conditions for their perceive relevance to the phenomenon under study; or when the boundaries are not clear between the phenomenon and context.

On the basis of Yin's (2003) findings, Farquhar (2012) states that case studies are 'empirical investigations' which are suitable for investigating events, for addressing research questions in a contemporary context and for answering questions that start with 'how, who and why'. The strengths of the case study research are that it allows the researcher to perform an in-depth enquiry into a topic of interest or phenomenon in its context. Thus, the findings generate understanding into how the phenomenon actually occurs within a given situation. Farquhar (2012) states that by using several different data sources and data collection methods, the research findings are strengthened through triangulation of the evidence. Triangulation is an important concept in case study research because an investigation of the phenomenon from different perspectives enhances robustness.

By incorporating the literature review, research philosophy and the research design, the case study presents itself as the most appropriate methodology for this research. The case study is a research strategy focusing on understanding the dynamics present within single settings (Eisenhardt, 1989). Thus, as per McNeill and Chapman (2005) this methodology was decided on after careful consideration of the aspects of the research question with the aim of ensuring the quality of the study. This decision is further substantiated by looking at the precedent set in the field of FM and Urban FM where it can be noted that the case study has been used as the research methodology in many instances. For example, Kasim and Hudson's (2006) research into FM as a social enterprise used a regeneration case study of neighbourhood facilities. Chotipanich and Nutt's (2008) research on a decision framework for positioning and repositioning FM support arrangements relied on a case study methodology using five corporate organisations based in Thailand. Alexander (2008) used an action research approach within three community case studies in Salford, Rochdale and North Manchester to investigate having social enterprise in place for managing community facilities in the context of FM. Michell *et al.* (2016) presented a single case study of a public facility in the

greater Cape Town metropolitan area in their research into the emerging field of Community-based FM.

3.2.5 The Case Study Selection

Stake (2005) advises that the selection of the case to be studied should be one from which it is felt that the most can be learnt. Indeed, the case study is not a "methodological choice but a choice of what is to be studied" (Stake, 2005:443). Stake (2005) identifies three types of case study, namely: intrinsic case study, instrumental case study, and multiple or collective case study. The intrinsic case is one where the researcher zealously seeks in-depth understanding of a particular single case of interest with all its singularities and ordinary attributes to the exclusion of everything else (Stake, 2005). The instrumental case is one where the case under study is of secondary interest in itself and acts as a support for generating understanding into the primary interest which is a phenomenon attached to or around it (Stake, 2005). In such a study, the case is investigated in depth with consideration for its context and ordinary characteristics but only as a means to achieving better understanding of the external concern or interest (Stake, 2005). The multiple or collective case study is an extension of the instrumental case study where several cases are studied to understand a single condition or phenomenon.

Although the single case study is criticised for its uniqueness, Yin (2003) explains that it is acceptable if a strong argument for its justification is provided. Upon analysis of the research question a single case study is deemed as the most appropriate since it enables the researcher to study a bounded system (Creswell, 1998) using informative and contextual data to interpret the findings about the phenomenon under exploration. These interpretations by the researcher will lead to a more complete understanding of a specific aspect of a situation providing information that could not be collected otherwise (MacNealy, 1997). Although Yin (1984), Stake (2005) and Flyvbjerg (2006) all agree that case studies have shortcomings due to the generalisation concept associated with this type of study, Flyvbjerg (2006) argues that the research should be driven by the subject matter.

Indeed, Njie and Asimira (2014) claim that the focus of the case study is to dig out the characteristics of a particular entity through focus on a single unit with an in depth description of the phenomenon, anchored on a real live scenario and using multiple data collection methods.

Unlike survey researchers, case study researchers have the goal of generating an intensive analysis of a single case (Bryman and Bell, 2007). Thus, the selected case for this research is Ebene Cybercity in Mauritius. Ebene Cybercity as an urban precinct is the result of the local government's initiative to provide the infrastructure for the ICT development of the country and its development and evolution were guided by both private and public stakeholders. In an effort for improving understanding of the relationship between buildings, people and the urban precinct as called for by Michell (2013) and to answer the research question, it presents itself to the researcher as the unique "choice of what is to be studied" (Stake, 2005:443). It is an instrumental case where its unique setting in Mauritius allowed the researcher to gather considerable amount of information in order to obtain valid findings in tackling the research question.

3.3 Overview of Research Methods

The different methods of data collection used in the case study research are described in the following sections.

3.3.2 Focus Groups

Morgan and Spanish (1984) describe focus groups as a qualitative method of data collection where several participants are gathered to discuss a topic which is of interest to themselves and the researcher. The participants are generally guided through the discussion by a moderator, often the researcher himself. The latter can rely on audio tapes and prepare transcripts of the focus groups' discussions to be used as a stand-alone source of data or as an addendum to other forms of collected data. Thus, Morgan and Spanish (1984) highlight that focus groups, as a

form of data collection, can be both unique and standalone, and complementary to other qualitative or quantitative data collection strategies. Morgan (1996) states that, combined with other methods, focus groups can provide preliminary data or can be used as a follow up to the core research to clarify findings from another method.

3.3.3 Documentary Evidence

Bowen (2009) explains that documents can be described as text and images recorded with no input or intervention from the researcher and states that, for many years, researchers in qualitative research have relied on documents from organisations and institutions. Documents provide additional research data and the information and insights gained from them can supplement a knowledge base in a valuable way (Bowen, 2009). Stake (1995) believes that documents may serve as substitutes for records of activity that the researcher could not observe directly and that there may be circumstances where the observation abilities of the recorder are better than those of the researcher. Bowen (2009) provides a non-exhaustive list of documents that may be used for systematic evaluation during the research. They include, amongst others, advertisements, minutes of meetings, manuals, books and brochures, diaries and journals, letters, maps, newspapers clippings and articles, radio and television program scripts, organisational or institutional reports, survey data; and various public records. Merriam (1988) points out the potential of all types of documents in helping the researcher gaining insight into the research problem by uncovering meaning and developing understanding.

Document analysis, according to Bowen (2009:27), is a ‘systematic procedure for reviewing or evaluating documents’ in printed or electronic form. Document analysis is particularly applicable to qualitative case studies as a research method in the quest to producing rich descriptions of a single phenomenon (Bowen, 2009; Stake, 1995; Yin, 1994). Bowen (2009:32) thus explains that the analytic procedure entails “finding, selecting, appraising and synthesising data contained in documents” through superficial and thorough examination and interpretation. This

iterative process combines elements of content analysis -- which is the process of organising information into categories related to the central questions of the research -- and thematic analysis -- which is the organisation of the data through the generation of major and categories and in case examples (Bowen, 2009; Labuschagne, 2003). Document analysis, when used jointly with qualitative research methods, is a means of triangulation—'the combination of methodologies in the study of the same phenomenon' (Bowen, 2009; Denzin, 1970:291). Noor (2008) also explains that the use of documents supplements and compensates for limitations of other data collection methods. They enable cross validation of data collected from various data collection methods such as interviews and observation and provide a guideline for interviews.

Yin (2009) highlights the explicit role of documents in data collection and identifies three main uses of documentation; to allow for spell checks of titles, names and terms used in interviews, to corroborate data from other sources and hence tackling any contradiction and thirdly to enable inferences. Yin (2009), however, cautions against the over-reliance on documents and the pitfalls of not recognising the potential bias of certain documents. Yin (2009) also advises to use a 'triage' system to focus on documents which are more central to the inquiry.

3.3.4 Interview Approach

In-depth interviews are one of the most common qualitative methods since they succeed in humanising the research problems (Mack *et al.*, 2005). Interviews enable the gathering of a large volume of data in a short period of time (Longfield, 2004). According to DiCicco-Bloom and Crabtree (2006), individual face-to-face in-depth interviews aim to promote discovering the individual experiences and points of view on a specific subject. By asking open-ended questions, in-depth interviews encourage detailed answers from the respondents relative to their experiences and opinions and allow the interviewee to share rich descriptions of phenomena while leaving the interpretation or analysis to the investigators (Mack *et al.*, 2005; Warre, 2005). These responses are then analysed by the researchers to deepen their understanding of the participants' attitudes, beliefs and

perceptions, making in-depth interviews useful for learning about the perspectives of individuals (Mack *et al.*, 2005). Moreover, they are useful tools in situations where sensitive information is being shared by participants (Longfield, 2004). The different interview formats can be loosely be categorised as structured, semi-structured or unstructured (Longfield, 2004) as discussed below.

Types of Interviews

1. Structured Interviews

Similar to a survey, this form of interview is made up of a series of predetermined questions providing a close-ended question format which is suitable for quantitative data analysis (Longfield, 2004). DiCicco-Bloom and Crabtree (2006) believe that in highly structured survey interviews and questionnaires, the interviewee is more a conduit from which interview is retrieved. Firmin (2008) state there are four main circumstances which require the choice of structured interviews by qualitative researchers. The first one is to allow for comparison among groups and the second is when interview waves are being conducted where the initial contact with a participant is through structured questions followed up by less structured interviews. The third circumstance is when the research methodology is primarily quantitative but the researcher requires an open-ended component to supplement the findings. There, a structured approach to data collection might be easier for the researcher allow for better integration of the interpretations to the quantitative findings. Last is when the interviewees are low-functioning with disabilities or handicaps and may have tendencies to ramble or lack focus on the research topic. Longfield (2004) states that such interview processes are suitable for drawing comparisons between responses provided and the original hypotheses.

2. Semi-Structured Interviews

Noor (2008) explains how semi-structured interviews are adequate where various approaches are investigated in one specific research area. DiCicco-Bloom and Crabtree (2006) believe that, unlike in structured interviews, in less structured ones the interviewee is more a participant in meaning. In this regard, the

interviewer follows a guide which typically contains a general framework for the interview while allowing the freedom to alter the order of the questions and to allocate more time to some questions as is required (Morgan and Guevara, 2008). Thus, researchers have structured questions and they also provide a platform for the development of new questions as the interview process is occurring (Longfield, 2004). The new questions allow the exploration of new fields with different participants and this type of interview is well suited for situations where access to participants is limited (Longfield, 2004).

3. Unstructured Interviews

No interview can truly be considered unstructured but they can be described as somewhat equivalent to guided conversations where the researcher seeks to find out the personal views of the participant on the subject matter (Longfield, 2004; DiCicco-Bloom and Crabtree, 2006) . Unstructured interviews are based on the research themes and topics whereby no set of questions have been predetermined by the researchers who conduct the interview based on the research participant and his role (Longfield, 2004).

For the study, the in-depth interviews were carried out using a semi-structured approach. Thus, a pre-set list of questions was formulated for each stakeholder category, and these were adapted as the interview process carried on and during the interviews themselves to gain further insights in new relevant topics broached.

3.4 Research Ethics

Guillemin and Gillam (2004) suggest that there are at least two major dimensions of ethics in qualitative research namely procedural ethics and ethics in practice. The former would include the approval seeking process from an ethics committee and following an ethics checklist. This checklist would thus include, in the research design, considerations with regards to issues ranging from potential risks to participants and finding the balance between them and the benefits to the research, protection of confidential data and to the use of consent forms.

Following such ethical procedures and applying these considerations are claimed by Mack *et al*. (2005) to be essential in order for researchers to protect their participants during qualitative research and ensuring their autonomy, anonymity and confidentiality of data collected. Thus, informing participants of the research procedure in terms what will be done with the information acquired, how their identities will be protected and receiving their informed consent prior to conducting the research are very important. These ethics are applicable to the different qualitative data collection methods including the three most common methods being 'participant observation, in-depth interviews, and focus groups' (Mack *et al*., 2005). DiCicco-Bloom and Crabtree (2006) consider four ethical issues related to the interview process namely reducing the risk of unanticipated harm; protecting the interviewee's information; effectively informing interviewees about the nature of the study, and reducing the risk of exploitation.

However, Guillemin and Gillam (2004) point out that the potential harms to participants in qualitative social research are difficult to define and stem from the complex dynamics between researchers and participants. Thus, specifying, predicting and describing them during the approval seeking procedure in ethics application forms is rendered difficult and hence the risk minimising strategies remain vague. Thus, to help the researcher in applying ethics in practice, Guillemin and Gillam (2004) advocate for the adoption of a reflexive research process during the whole course of the research to cater for these *microethics* as termed by Komesaroff (1995). This would entail consistent critical scrutiny and interpretation to the research methods and the data, the researcher himself, the participants, and the research context.

3.5 Data Gathering Procedure

To understand how the FM principles were being applied in the management of the urban precinct, the different stakeholders being influenced by and influencing the management were first identified and used for data collection. In a first instance, the end users of the whole infrastructure, that is, the building, the open

space, the utility services amongst others were considered. This was done by using a focus group to collect and understand the experience of the occupants and assess its sustainability - in terms of quality of life - from their point of view. The participants chosen were picked because they would make an eclectic mix of users, were easily accessible for the research, and would eloquently express their thoughts and opinions. They would remain completely impartial but would feel at ease enough to participate in the focus group and trust the researcher as the moderator.

In a second phase, the stakeholders directly and indirectly influencing the management of the precinct were identified and used for data collection through in-depth, open-ended interviews. Thus, the operational decision makers including the property development company owning and managing the urban precinct were considered. In parallel, key persons from the government authorities and local agencies and mixed public/private service providers such as transport and utility service providers were approached. Thus, at the outset of the research, the qualitative data collection process was inspired from Deakin, Hudson and Symes (2005) and was aimed to be as detailed in the following **Table 3.**

Table 3: Data collection methods according to data types

Type of Data	***Collection Method***
Data related to the different businesses and individual offices & buildings	One-on-one Interviews Personal contact with maintenance and personnel managers and original designer Focus group of end users
Data related to the whole precinct infrastructure	Desk-based research (internet + publications) Personal with Technicians (Water Management Authorities, Central Water Authority, Traffic Management)
Data for Comparison	Desk-based research (internet + publications) Personal Contact with Experts

Adapted from Deakin, Hudson and Symes (2005:138)

3.5.2 Introduction

The primary source of data for the research came from a series of in-depth interviews with:

1. The Main Developer
2. The Major Business Owners operating in the Precinct
3. The Users
4. The Public Utilities Services Providers
5. The Representatives of Local Authorities

The focus group was more of an informal discussion of the different aspects of the Ebene Cybercity and the participants were allowed to speak freely and were invited to give their opinions on the different management aspects of the precinct as they lived it.

One-on-one interviews were also conducted with other end users. Respondents were basically questioned with regards to their experience as end users of the different facilities of the precinct and the precinct as one entity as a whole. In addition to the facility users and the small business owners, representatives of major corporate structures and major business enterprises were also invited to participate in the interview as they took part in the development of the Ebene Cybercity and would provide quality and updated information. The interviews with the latter group were centred on a more strategic and global perspective of the development and management aspects of the precinct.

The in-depth interviews relied on a semi-structured form of interviews. Thus, a series of questions were prepared beforehand and were adapted with respect to the stakeholder and the direction of the interview and over the course of the interview process from one participant to another. This generated hours of transcription and through the repetitive readings of the transcripts and listening of the interviews, the data collected could be broken down into emerging themes.

The following documentary evidence was provided by the main developer during the interviews with the different representatives:

1. Original Master Development Plan,
2. Archive photographs, and
3. Catalogues about the precinct.

Printed and electronic newspaper articles and the official website of the developer were also used as sources of data during the research process as supplementary information about the case and is utilised and referred to in **Chapter 4**.

3.5.3 List of Questions

To ensure that numerous aspects of the research were covered, a generic list of questions was drafted prior to the interviews as a guide to the face-to-face conversation and as an aide-memoire for the researcher. However, since these were semi-structured interviews, the questions were adapted along the course of the exchange.

An example of a list of questions used as a guideline and an aide-memoire during one of the interviews is available in **Appendix A**.

These pre-set interview questions were derived from desk-based research and the literature review and were formulated with the aim of generating data to answer the research question.

Questions to the representatives of the developer **X05** started out with generic questions about their role in the organisation and their involvement in the urban precinct and its management. Also, questions about the developer's organisation itself and the legal status of the precinct and the organisation were formulated further to desk-based research from newspaper articles and websites. Those about the precinct's geographical boundaries and the infrastructure of the precinct were generated from topics raised during the focus group. Questions around the

management of the precinct and the different stakeholders involved came largely from the literature review. Thus, as a state-owned company, the organisation's relationship with the local government and the role of the local government in the development of Ebene City were central to the questions further to Michell (2010) and Heywood (2010). Questions along the line of the management of the different buildings as a single entity or as stand-alone buildings were derived from Michell (2013). The questions focusing on the role of the different stakeholders and the different 'urban actors' were based on Breed (2008).

The interview guidelines used when questioning the operators, representatives of the different business organisations, and the Facilities Managers were largely based on the work of Deakin, Hudson and Symes (2005) where the SUD framework of the BEQUEST initiative and the BIFM's competency areas were adopted.

3.5.4 Observation of Research Ethics during Research Process

The research ethics discussed in the previous sections and the steps to solve the above mentioned ethical issues were applied at every point of the data collection for this research. Prior to the start of the research, the researcher applied for and received the ethics clearance which can be found in **Appendix B.** Before the start of the interviews and the focus group, each and every participant was handed a copy of the Information Sheet and Consent form in **Appendices C** and **D**, the content of which was read out and explained. The discussions were tape-recorded with the consent of the interviewees to prevent loss of data and allow more accurate and in-depth data analysis after transcriptions of these interviews. All the interviewees consented to be recorded. A labelling code was used to safeguard the anonymity of each participant and this labelling system was thoroughly explained to the participants. Care was also taken to ensure that information provided by the participants could not be linked to them, thus ensuring the confidentiality of each participant. Thus, even the building names were coded. The following labels were used and they were kept sufficiently broad to avoid the risk of any potential identification of the participants. A confidentiality code was also given

to people who did not participate in the study but whose names were mentioned by the interviewees, these included high-profile politicians. The names of organisations were also given the protection of anonymity by assigning them a confidentiality code as well. The confidentiality codes are summarised in **Table 4** below.

Table 4: Confidentiality codes labelling the stakeholders

Confidentiality Code	Stakeholder
RP	Research Participant
NI	Not interviewed
NP	Non-Participant
X	Organisation
B	Building

Each stakeholder who participated in the research either in the focus group or the one-on-one interviews were labelled RP. Stakeholders who were contacted but were not available to participate in the research were labelle NI. The label NP was also created for stakeholders who were mentioned in the interviews and focus group discussions but who were not approached to participate in the research. These included politicians or heads of regulating bodies amongst others. As a result, the names of people were not kept on record. The interviews and the focus groups were conducted in a mixture of Mauritian Creole, English and French and there were then translated to English and transcribed to be analysed. To better understand the interview procedure and how the respondents were identified and approached, refer to **Appendix E** which provides a snowball map of interviews. A randomly selected sample interview transcript is included as **Appendix F**.

3.6 Qualitative Data Analysis Method

Marshall and Rossman (1999:150) define data analysis as the process of 'bringing order, structure and interpretation to the mass of collected data'. The researcher searches among data to identify content by looking for general statements about relationships among categories of data by determining such categories,

relationships and assumptions that inform the respondents' world perspective, and their views of the topic under study (Marshall and Rossman, 1999; McCracken, 1988). Basit (2003) explains that data analysis is not a mechanical or technical exercise but is rather a dynamic process where the researchers apply their intuition and creativity to think, reason and theorise. Thus, throughout analysis, researchers seek to deepen their understanding of what they have studied and to continually refine their interpretations through their personal experience with settings, informants or documents (Basit, 2003; Taylor and Bogdan, 1998). Basit (2003) explains that qualitative data analysis is not a discrete procedure carried out at the end of the research but is in fact an all-encompassing activity that continues throughout the research project. This echoes Pope, Ziebland, Mays (2000) who highlight that data analysis often takes place alongside data collection so that the questions may be refined and the direction of inquiry be adapted.

According to Braun and Clarke (2006:79), thematic analysis is an independent qualitative descriptive approach for 'identifying, analysing, and reporting patterns (themes) within data'. Bloor and Wood (2006) state that the purpose of content analysis is to examine what was said to whom by whom and with what effect. Examining relationships is central to the analytic process, because it allows the researcher to move from simple description of the people and settings to causal explanations of contextual events (Schutt, 2009). The use of qualitative descriptive approaches such as descriptive phenomenology, content analysis, and thematic analysis suits research where a relatively low level of interpretation is required (Vaismoradi, Turunen and Bondas, 2013; Sandelowski and Barroso, 2003). This is in contrast to grounded theory or hermeneutic phenomenology which require a higher level of interpretive complexity (Vaismoradi, Turunen and Bondas, 2013; Sandelowski and Barroso, 2003). Indeed Pope, Ziebland and Mays (2000) state that, in most qualitative analyses, the data are preserved in their textual form and indexed to allow for the generation or development of analytical categories and theoretical explanations. These categories/indexes/themes may be derived inductively - that is, obtained gradually from the data - or used deductively, either at the beginning or part way through the analysis as a way of approaching the data (Pope, Ziebland and Mays, 2000).

According to Schutt (2009:325), most qualitative analysis methods rely on the following steps:

1. Documentation of the data and the process of data collection;
2. Organisation/categorisation of the data into concepts;
3. Connection of the data to show how one concept may influence another;
4. Corroboration/legitimisation, by evaluating alternative explanations, disconfirming evidence, and searching for negative cases; and
5. Representing the account (reporting the findings).

Since the research is based on a social constructivist, interpretivist framework, themes will be used to organise the data and the key observations to allow for the presentation and interpretation of the findings and to develop theoretical explanations. This is done in the following chapter.

3.7 Limitations

The research methodology and the context of the research gave rise to certain limitations to this study. The first limitation is that it is based mainly on the opinions of the different stakeholders since the main data gathering method was face-to-face in-depth interviews and these are associated with response bias (Kahn and Cannell, 1957). Response bias may be generated from the interviewees' belief that it is comforting and non-threatening to behave in a typical and non-controversial manner (Snyder and Ingram, 1983; 53, Catania *et al.*, 1986). This may contribute to motivating the respondent in falsifying a response in an attempt to give a good impression out of fear of punishment or anticipation of reward for their replies (Williams, 1964). However, Eisenhardt and Graebner (2007) advise that this can be mitigated by using bias-limiting data collection methods through multiple and highly knowledgeable informants to provide diverse perspectives of the phenomena under study. In the context of this research, the high calibre of the interviewees, with the research participant being highly educated and experts in their fields or owners of their own businesses, ensured there was no potential for bias out of fear of reprisal or in anticipation of reward.

The second limitation was that some participants whose responses could have contributed to the study could not be reached or some, although willing, were unavailable to participate in the study in the time frame of the research

The third limitation was that being multi-lingual in their everyday speech, the research participants used a combination of English, French and Mauritian Creole in their responses. However, based on Van Nes *et. al* (2010), there was no loss in validity of the qualitative study since, with participants and the researcher speaking the same languages, there were no language differences in data gathering, the transcription of same and during the first analyses, because the first coding phase stayed closely to the data.

The last limitation was that the study is bound by the timing of the research as the case under study is dynamic and is not static in time and could have generated different data if studied at a different point in time.

3.8 Conclusions

This chapter started with a discussion of the conceptual framework which underpins the research and which informs the methodology and data collection methods. The theory of qualitative research methodology and the case study selection were briefly reviewed followed by a discussion of the different qualitative data collection techniques and the research ethics protocols that were observed. The data gathering procedure, in-field, was then explained as well as the application of the ethics during data collection and presentation. The theory and procedures for qualitative data analysis were then explained. The following chapter presents the data collected during the research and the data analysis.

CHAPTER FOUR:
CASE STUDY AND ANALYSIS: EBENE CYBERCITY

4.1 Introduction

This chapter serves to present the findings and provide an analysis based on the methodology chosen i.e., from the case study of Ebene Cybercity. Adopting the qualitative data analysis explained in the previous chapter, themes were developed to allow the findings to be broken under different sections. This was done in such a way as to allow the researcher to better answer the research question. In this sense, the findings are broken into two main sections. The first section relates to providing a context for the Ebene Cybercity, thus this chapter begins with a brief outline of the history and location of Ebene Cybercity in respect of the whole island of Mauritius Ebene Cybercity is examined in terms of its background, its key features and key role players, its continuously evolving functions and the challenges that it faces. The researcher then identifies the principles of Urban FM that are displayed in the management of the precinct as a whole and the key criteria promoting its implementation. Throughout the chapter, the findings are corroborated with the theory of Urban FM as reviewed in Chapter 2.

4.2 Context

4.2.1 Context and Demographics of Mauritius

The Republic of Mauritius is an island nation situated in the southwest Indian Ocean, about 900 kilometres east of Madagascar far removed from its major markets and suppliers of raw materials (WTO, 2001; UNDP, 2016). Small and densely populated, it covers an area of 1,865 km^2 and has an approximate population of 1.3 million people (WTO, 2001; UNDP, 2016). An economic growth rate averaging 5-6% annually for the past few decades has improved the welfare of citizens of Mauritius, (UNDP, 2016). However, the rising standards of living have

also been accompanied by an increased demand for energy resources and greater generation of waste.

Benoit (2015) explains that over the last thirty years, Mauritius has diversified into high-growth industries such as offshore finance, textiles and tourism. The economy worth is $ 12.6 billion with a GDP per capita of $9,300 and the government's primary goals for 2020 are to elevate annual GDP growth to more than 5%, which has remained as the average rate for most of the last 30 years; raise GDP per capita to $12,000; and become a high-income country. The innovative initiatives to revitalise the economy include building a nationwide network of smart cities; transforming the capital of Port Louis into a regional hub; establishing a bank specifically to support small- and medium-size enterprises (SMEs); restructuring investment plans for tourism resorts and real estate; and cutting red tape to improve the business climate and facilitate foreign direct investment (FDI) inflows. **Figure 12** shows the prospective Smart Cities and Techno-Parks which have been planned for future development. In all, a Master Plan of eight Smart Cities and five Techno-Parks has been envisaged.

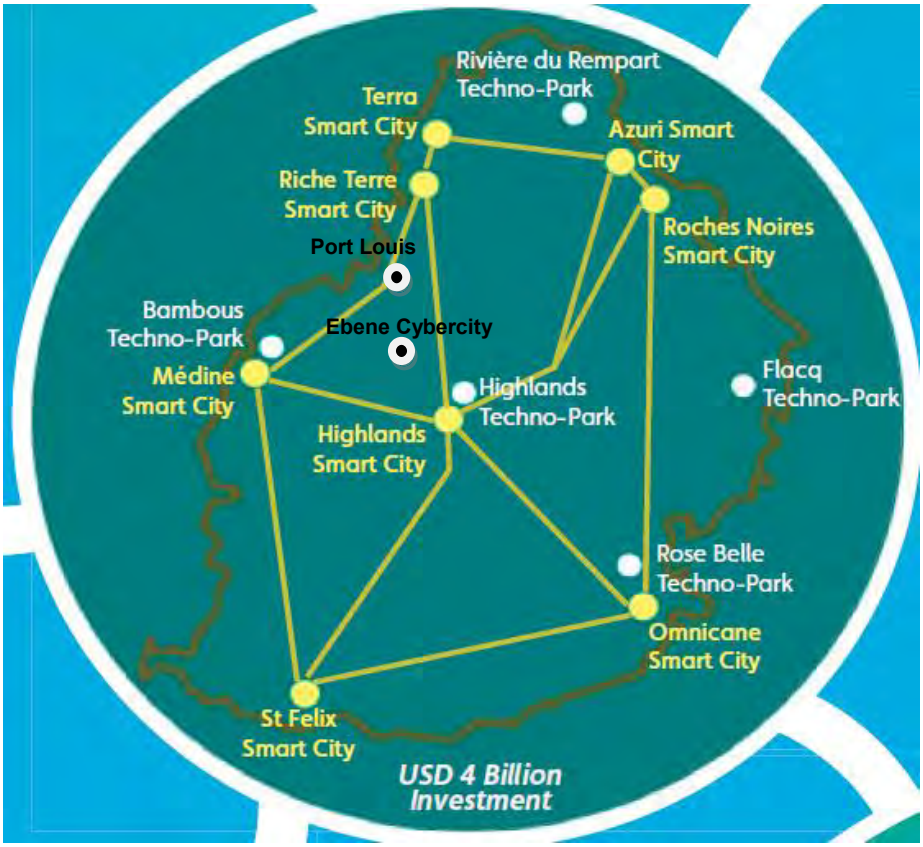


Figure 12: Planned Smart Cities and Techno-Parks in Mauritius

Source: Benoit (2015:3)

4.2.2 Physical Land and Location of the Ebene Cybercity

The Ebene Cybercity is situated at 15 km south of Port Louis, the capital of the island. The precinct, in the Ebene Triangle, occupies a surface area of approximately 520 000 square metres and is bound by the M1, which is the motorway running from the international airport in the South East of the island to the north through the capital, and two other main roads, A1 and B2, thus giving it its triangular shape as shown in **Figure 13**.

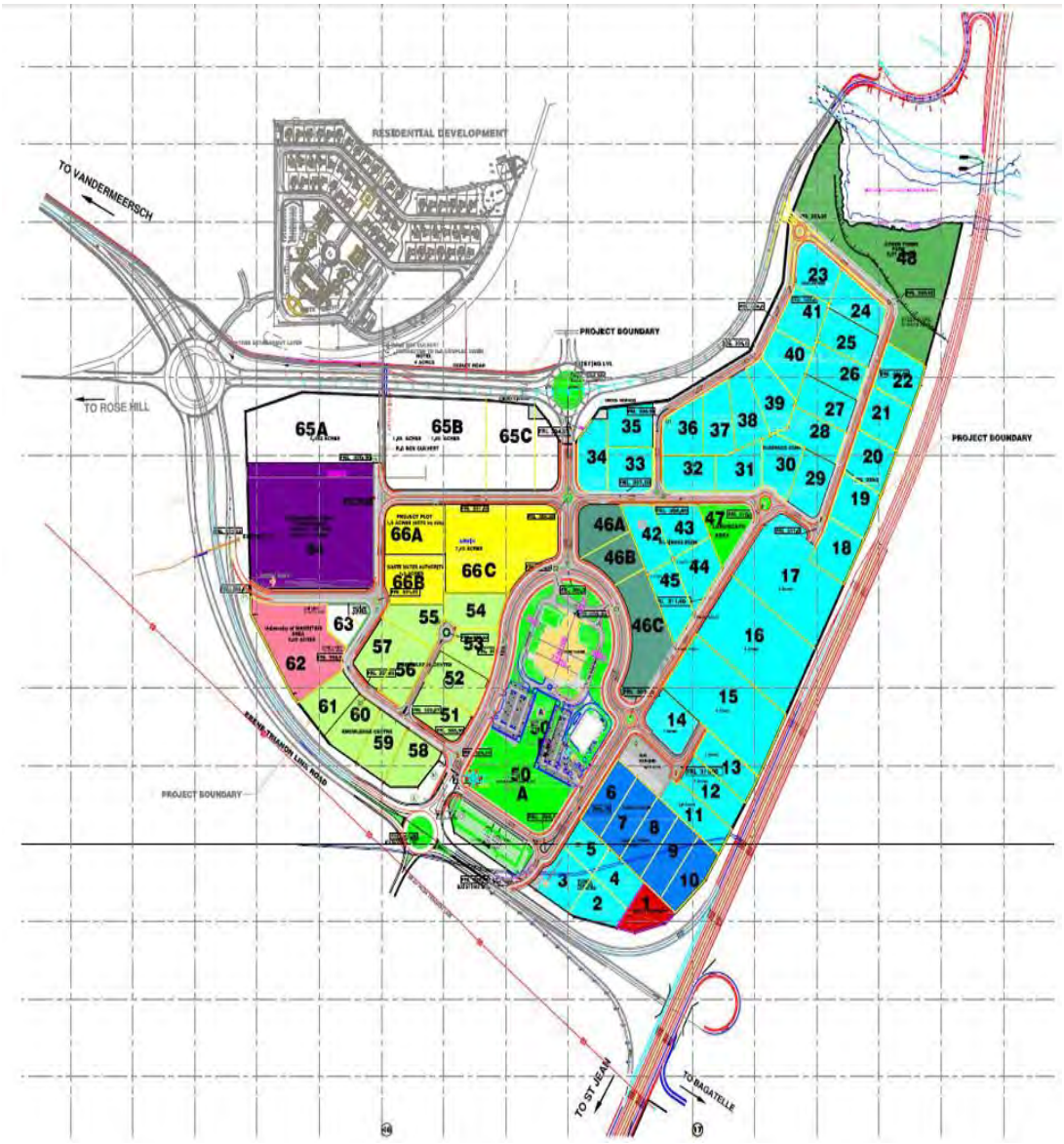


Figure 13: The Ebene Triangle

Source: e-cybercity.com

As explained by **RP07** and **RP10,** the precinct is located at the centre of the island and, although originally under sugarcane fields, it benefitted from being accessible by the major roads:

> ***RP07:*** *The idea was to have this land, which we call the Ebene triangle, because of its shape, which is easily accessible and which is in the middle of the country***.**

> ***RP10****: Even if we were surrounded by sugarcane fields, everyone knows the Ebene triangle. You leave Reduit and go towards Rose-hill. You see the cane*

> *fields...That's before the harvest...But immediately after the harvest, when the crops were cut, what could you see? The motorway on the other side!! On the one side there was Rose-Hill, on the other there was connection of Rose Hill-Reduit, Reduit-Trianon and then Trianon-Rose Hill, giving rise to a triangle…*

The site of the urban precinct prior to construction and showing the agricultural land after the sugarcane harvest can be seen in **Photo 1.**

Photo 1: Pre-construction site of the Ebene Cybercity in 2001

Construction of the urban precinct started in 2001-2002 on agricultural land which was up to then under the cultivation of sugarcane fields:

> ***RP07:*** *So, you know, Ebene, we have the cybercity, it consists of a plot of land of 152 arpents and we have developed in 2002, and there are 70 plots/lots*.

As explained by **RP07**, the name Ebene Cybercity was derived from the city being promoted as a new information technology hub for Mauritius and serving as a bridge between African and Asian markets:

RP07: *It was covered in sugarcane plantations and with the Ilovo deal and all, the Government had its project of wanting to develop the ICT and with the vision of the Government to make the island a 'cyber island', the first step was to develop Ebene.*

4.3 Key Features of the Ebene Cybercity

4.3.1 Central Location

From the answers of the different interviewees, it was seen that the location of the Ebene Cybercity on the island was its biggest selling point. This was noted both for the operators of the educational facilities and for the big corporations with regards to their workforce:

RP08*: Its proximity to the centre. That is the best advantage… Initially, when we opened up in Port Louis, we saw a big lack because of our location. Because we got the students from the north, but in the south we were losing students. So, when we moved and came to Ebene, we managed to capture this market of the south, and we retained the market of the north in Port Louis…*
RP09: *What is also interesting are all the roads that converge here. There are 3 or 4 more ways of getting to Ebene. So this is also an upside. Elsewhere there is only one way. We can arrive from Rose-Hill, from Quatre-Bornes, from the Saint-Jean axis, from the motorway.*

Even for the users of the precinct, as commuters, the location of the cybercity was a big attraction:

RP01*: It is close. Proximity. Plus it is not such a wide area, as compared to Port-Louis, it is not a large space. Every building is kind of within walking distance of each other.*

4.3.2 Public Infrastructure

The features that have ensured the sustainability of the precinct in terms of Quality of Life are the ability of the infrastructure to support the influx of people and to cater to their technological and physical needs as well as the architectural features. Indeed, all these factors are interdependent and could not be treated in isolation from the others and reflect the same observations highlighted by Melvin (1992) in **Chapter 2**.

The construction of **B05** in parallel with the infrastructure and civil works for the drainage facilities, access roads, street lighting in the precinct can be seen in **Photo 2**.

Photo 2: Construction of B05 in parallel with infrastructure and civil works for the precinct in 2002

The urban precinct can be viewed in **Photo 3** showcasing the different buildings with their distinctive architectural features.

Photo 3: Ebene Cybercity buildings

Source: From X05, 2009

Photo 4 shows an aerial view of the urban precinct with its network of roads and round-abouts.

Photo 4: Aerial view of the Ebene Cybercity

Source: flyingfreaks.mu

RP07 and **RP06** both believe that the ability of the precinct to provide all its users with the best infrastructure and provide the best services to maximise efficiency of the business operations are its main selling points:

> ***RP07**: The services. As I told you before, the services are on point. We have never had any complaint about the optic fibre. Most of the companies here, of which there may be 400, are export-oriented. They work with the USA, with Europe, and they cannot afford any interruptions or failures in the Internet service. There are all kinds of redundancies in place. There are never any power cuts. The work environment is good. It is well situated, with people coming from Port-Louis, the airport, etc. But most of the work force comes from the Plaines-Wilhems region. And the brand name has also become well known. Cybercity, the first intelligent buildings, some people want to come here for the address.*
> ***RP07**: The most important is to have everything that has to do with the infrastructure i.e. water, electricity, fibre optics and everything else.*

RP06 also lauds the provisions made in the facilities of the whole precinct to accommodate disabled people and the adherence of all the buildings to the health and safety standards:

> ***RP06**: For disability considerations, all our toilets were made to accommodate handicapped people. There are ramps access everywhere. For fire and safety requirements, they change everyday. It depends on your type of activity. But all of our buildings are compliant*

Thus, in terms of safety or transport facilities also, the Ebene Cybercity has been praised to be of very high standards:

> ***RP09**: for transportation in general to get to Ebene, for the staff to arrive, it is okay.*
> ***RP02**: No. It is a very safe place to be. There is no worries about the your safety or security in Ebene.*

4.3.3 Urban ICT

From its very creation and to attract flagship companies, the Ebene Cybercity was marketed as featuring IT infrastructure of high calibre with high tech business park facilities, and Mauritius itself was promoted as having the appropriate legal framework, and a strong human resource base (Empinat, 2015).

The Mauritius Telecom, who is the main internet provider in Mauritius and in the Ebene precinct has transitioned from narrowband to broadband and Internet Protocol (IP) services. Thus, Ebene with its call centres, BPO operators and bandwidth-hungry customers, is provided with international bandwidth services for global connectivity. Ebene is linked by sub-marine fibre obtic cable systems like SAFE, LION and EASSy as well as satellite (Mauritius Telecom, 2014). In fact, Ebene hosts the African Network Information Centre which is the Regional Internet Registry (RIR) in charge of the distribution and management of Internet number resources such as IP addresses and ASN (Autonomous System Numbers) for the African region (AFRINIC, 2016). The availability and reliability of such an advanced globally interconnected infrastructure is a big selling point for Ebene for different business organisations:

> ***RP09**: Well, today… Internet speed, yes. Because in general, Ebene is the best served region in terms of the internet. Even the backup. There are two nodes that come to Ebene, and soon a third node that will make Ebene… uh… there will be no downtime with respect to the internet because of how this was done.*
> ***RP08:** …because we have computer-based exams here and we rely heavily on this technology… and we expect that this philosophy of an Education Hub that it coincides with the right level of internet speed etc.*

4.4 Key Players of the Precinct

As the interview process progressed, the hierarchy of the ownership system and how it impacts on the development and management of the precinct became

clearer. This allowed the development of a tree diagram as shown in **Figure 14**.

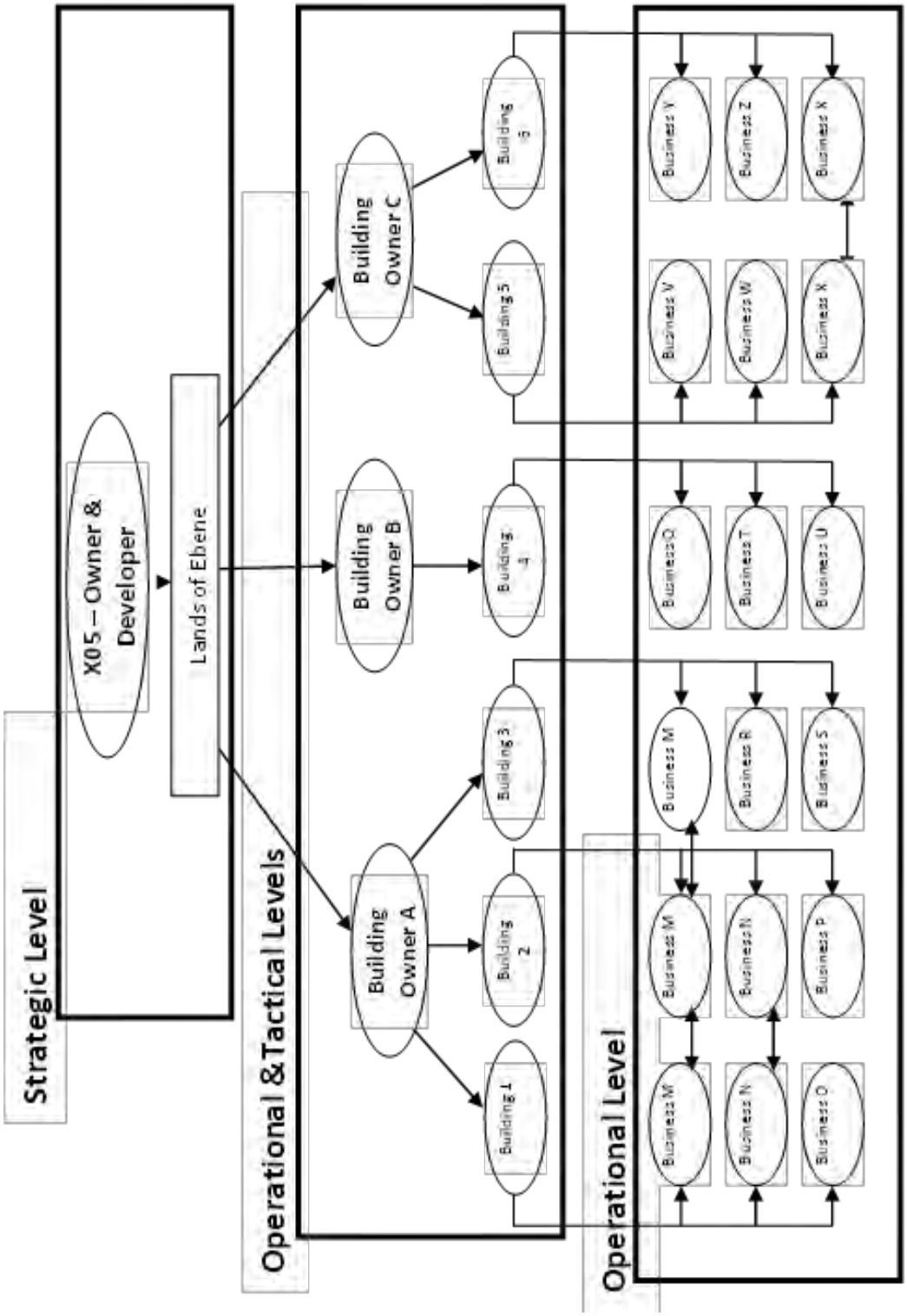


Figure 14: Generic Overview of Ownership System in the Ebene Cybercity

In this section the dynamics of the different stakeholders as identified in **Figure 14** and hence the role that each player has in the overall management of the precinct are discussed.

4.4.1 The Main Developer

X05 was established in 2001 to spearhead the physical infrastructure development for the transformation of Mauritius into a *cyber island* and its first assignment was the setting up of the Cybercity project at Ebene. The initial infrastructure comprised of the **B05** with in-built optic fibre-based telecom network directly linked to the high-speed SAFE digital highway (ICT Outlook 2000-2004, 2004):

> ***RP06**: Profit-making institution. Interference? No. But, in between inverted commas we are the executive arm of Government, in IT infrastructure development. We are here to create business parks and now we will create IT parks which we also call techno-poles.*
> ***RP06:** Umm, as I have told you, it is a private company but the principal shareholder is the Government with 99.99% of shareholding and it is not the role of the Government to grow buildings everywhere. We are here, we develop the sector, and it is up to the private sector to follow in the trend.*

The government set up the **X05** to head the development, construction and management of state-of-the art technology and hi-tech Business Parks in Mauritius.
Thus, **RP06** explains that **X05** operates as the executive arm of the Government but retains all the profit-maximising goals of a private institution:

> ***RP06**: We operate as a company, we are incorporated under the Companies Act, we have a Board of Directors, we have our own budget, we receive nothing from the Government, no grant, nothing.*

The ownership system in the precinct is a complex system where the operators i.e. building owners lease the land from **X05** and build on the leased land:

> ***RP06**: The lands belong to **X05**, but we have, uh, uh, uh…[…] We have parceled out the lands, we have created leasehold agreements…*
> ***RP07**: And then the others came and we gave the different plots on leasehold agreements to the different companies. That is long-term leases. So, they all came with their different projects. Right?*

The leasehold agreements were made on long-term for 90 years as explained by **RP06**:

> ***RP06****: It's 30 years times 3 which is 90 years. And you have the first 30 years and the extension over 3 times 30 years. Because all the land that you see here, belongs to* ***X05.***

The system is even more complicated since **X05** himself is the owner of several buildings including **B05** and, as an operator, views the other operators as business rivals:

> ***RP06****: …the operators are our direct competitors.*
> ***RP06****: We are in competition with the other operators.*

RP07 explains the procedure of how the properties in Ebene are developed:

> ***RP07****: No. But we own the land all around here and we lease the land to the different promoters. They come with their building plans and we give the clearance for the building. Someone comes with a project, asking for a planning approval […] Someone comes in with a project. He has plans for 5 buildings. I have to look at the concept, see if he has sufficient parking space, if there is enough setback from the roads, how many bathrooms they have, if the elevation is acceptable and the person has to do a traffic impact assessment.*

Then **X05** would make the liaison with the different authorities to facilitate the acquisition of the relevant permits:

> ***RP07****: When he submits all the paperwork, I setup a committee with representatives from the municipality, TMRSU, MPI, etc. And if everything is fine, he gets clearance and can get the required permit.*

Since there is such high demand for the land in the Ebene Cybercity, **RP07** explains that, once a leasehold agreement has been put in place, there are deadlines for the property developers to start the development of their projects:

> ***RP07**: No. As there is a high demand all the existing projects have to start soon since there are deadlines in place. We repossess the land if they go over the deadlines*.

The Main Developer and the Public Infrastructure

When questioned about whether the roads and all the public facilities fell under the developer or the municipality, it was discovered that X05 was no longer responsible for same:

> ***RP10**: The municipality. Because **X05** has already completed the handing over to the municipality*.
> ***RP06:** But there are the driveway services and roads etc which are under the municipality. Because all the internal roads, we have vested them on the Municipality of Quatre-Bornes…*

Indeed, all the internal roads at the onset of the project, used to be under the aegis of **X05** who was responsible for the maintenance of the public infrastructure utilities attached to the roads, that is the roads themselves, the stormwater drains, the streetlighting etc. However, **X05** pushed for the handing over of the public infrastructure to the Municipality of Quatre-Bornes because of the legal implications:

> ***RP10:** Yes. Legally, that makes a huge difference. If tomorrow for example, there is an accident on my parking lot, which is a private property, the police cannot intervene. It's the same for **X05**. **X05** realised that if they did not hand over that responsibility to the municipality, it would become a problem. Car accidents are a big problem technically and legally*.

4.4.2 The Operators and the Occupants

As the interview process showed, there are three categories of business organisations that operate in the precinct. The first category rents out space in the different buildings while the second one have bought a floor or more in the building

in which they operate and the last category has entered into a leasehold agreement with **X05** and have built the building in which they operate.

All the organisations that rent or own space in the different buildings will pay a monthly fee to the Management Agency for the management of the common areas. This would usually be the building owners themselves who through Management Agencies, look after the operations of the buildings and manage them. These are called the 'syndic' and the 'syndic fee' in the local jargon:

> ***RP11:*** *Yes, yes. They have bought, they have bought a whole floor and they have become a co-owner. Now, the syndic remains the syndic. Despite having bought, they need to pay the syndic fee because the common areas are managed by the syndic and we are the syndic. So we are the owner and the syndic.*

Service Level Agreements

Regarding the management of the two towers of **B05, RP07** explains that he himself is head of the internal FM team which manages the two towers:

> ***RP07****: We have a team, I myself I am responsible for this team as Manager for the Facilities Management. We have someone who is an expert in Electrical, another one in Mechanical, and in Building. So we look after everything that is Facilities.*

There are however, specialised service providers who are retained on contract for their expert intervention:

> ***RP07****: But at the same time, we have taken someone on as a service provider. It is* ***X10****. So, they are the Operations and Maintenance Contractor.*

RP11 provides deeper understanding about how the operator manages the different buildings that it owns through its Property Management Agency:

> ***RP11****: Yes, yes…Each building we have a dedicated team and a head of Maintenance. The Head of Maintenance who is on the spot, who has to be there, if*

> *there is a problem, he needs to find the solution. Most of my Heads of Maintenance, they are either Electrician, Plumbers, they need to be Jack of all Trades, a plumbing problem, an electric problem, lifts, everything, he must be able to solve anything.*

RP11's statement about what is internally managed by the 'syndic' that is the Property Management Agency and what is outsourced is similar to **RP07**:

> ***RP11****: Maintenance is us, finance is us for the syndic and all, we outsource the cleaning, security and the maintenance for the specialised parts…This we don't have a choice…Dedicated service provider such as Generators... We know it is* ***X11*** *who is the reliable…..So, here we have no choice, maintenance, that is we have a preventive maintenance that we have ongoing.*

Since security for the different buildings requires having in place complicated logistics, **RP11** explains that he prefers to outsource it:

> ***RP11****: This we outsource. Because for my part, I don't have the time to go manage the security part. Security is super complex The guy works late etc on the eve, and the next day he does not show up, so where would I go look for a replacement? I prefer outsourcing with a company and it's his responsibility.*

Further down, at the micro FM scale, the different business organisations also have service level agreements with regards to day-to-day aspects such as cleaning and security:

> ***RP08:*** *Well, not cleaning. Cleaning, we have to pay for. Security it is the syndic that looks after it. Maintenance of the grounds it is the syndic...Security, access to building, maintenance of the building as a whole that's the syndic, but on our floor, all the expenses that there are, that's us*
>
> ***RP09****: Exactly. Today we are working with a security company, with twenty or so people who work in our premises. So they are trained as security guards but also trained internally with regards to our policies. Our internal environment is quite particular so we have to explain what we expect of them. So this is done, and*

refreshed every month. When there is a new recruit for security, he is trained and has to have diplomas, etc. We cannot be approximate.

4.5 Challenges Faced by the Precinct

4.5.1 Planning, Parking and Traffic in Ebene

During the course of the focus group discussions, which was the starting point of the research, and during the course of all the interviews, parking and traffic came up recurrently as the biggest issues in Ebene:

> ***RP03:*** *However, as has been said by* ***RP01****, in terms of roads, transport and traffic it's not a success*.

These problems are acknowledged by **X05**. **RP07** explains that the issues of the cybercity have been noted and plans are being put in place to resolve same:

> ***RP07****: What we want to do is to have proper pedestrian areas, proper footpaths, covered drains because right now they are open, more landscape and trees, and proper public transport. We setup bus stops everywhere but we want use cutting edge technologies to get proper time-table for the buses, and for people to know exactly when the buses are arriving at each stop. And proper parking space.*

Lack of Parking

One of the biggest shortcomings in Ebene is in terms of its parking facilities. This can be seen in **Photo 5** and **Photo 6** which show the illegally parked cars along the roads of the precinct. The problem results from the lack of provision of sufficient parking at the time of planning. This is acknowledged by **RP07** who states that at design stage, parking for the number of cars that would come into Ebene was grossly underestimated and not provided for:

> ***RP07****: Yes, there is a problem of parking. That is, we never planned that this was going to take such huge proportions because there were several reasons.*

*Originally, we had planned that there would be one big building of 12 twelve floors here for the **B05** and then the small ones. But, in the end, what happened is that all the developers came in here with buildings of 10 floors and more.*

***RP09:** On the other hand, parking facilities is another story. I mean, unfortunately Ebene was built with a complete lack of planning with respect to parking, with respect to the roads. You can see illegal parking everywhere, people are parking their cars however they can. It is a real problem as we have no possibility of increasing the parking facilities while the buildings are cropping up like mushrooms and that is a problem.*

Photo 5: Illegally parked cars in the Ebene Cybercity (1)

Photo 6: Illegally parked cars in the Ebene Cybercity (2)

RP06, on the other hand, blames the parking problems on the mind-set and mentality of the users of the precinct and their unwillingness to pay for parking.

Congested Traffic

When asked about their driving experience in Ebene, **RP01** replied as follows:

> ***RP01****: Catastrophic!*

RP01 further explains that the main reason is because all the buildings have mainly one entrance and one exit which at clock in and clock out times create huge traffic jams:

> ***RP01****: When there is traffic, see…Each building has only one exit, most of the time. The exits all end in the middle, that is the centre of Ebene, and the streets are all extremely narrow and small. Thus, it creates huge traffic jams when all the businesses close at around the same time at five.*

Although **RP07** acknowledges the lack of planning and forecasting, he also rejects part of the problem as being chronic to the whole island:

> ***RP07****: So, all in all, we had never predicted that there would be…anyway, this is a national problem, it's like this everywhere in Mauritius…*

4.5.2 Dealing with Authorities in Different Sections

One big challenge faced by the operators in the precinct is that the location of the precinct makes it so that the different public services each fall under a different jurisdiction of the concerned local authorities. Thus, the different operators find themselves having to deal with the different authorities in different sections. When questioned about which municipality his operations fall under, **RP10** expresses his frustration with regards to this situation:

> ***R01:*** *Let's talk about your relationship with the municipality. You fall under the responsibility of the municipality of Quatre-Bornes?*

> ***RP10:*** *Yes Quatre-Bornes, because all the paperwork is done there. For police matters, I'm considered to be in Rose-Hill, for postal services, I'm in Rose-Hill too. It's a weird situation.*

Sketching out the positions of the buildings that he manages in the precinct, **RP11** explains the different jurisdictions that he has to go to depending on the different services that are concerned:

> ***RP11:*** *Do you see this road here, if a street light stops working here, I have to go to the Municipality of Rose-Hill, if this one stops working, I have to go to the Municipality of Quatre-Bornes, and this one here, I went to the Municipality of Quatre-Bornes who sent me to Rose-Hill who told me that I will show you the boundaries, Sir, this part is in Reduit and so is in the jurisdiction of the District Council…[laughs]…[sighs] So, you see the difficulties…?*

The above observation is in line with Scott and Storper's (2015) statement that units of urban land, in the form of individual intra-urban locations or entire neighbourhoods serviced by infrastructure, are interdependent and reflect the many 'individual', 'communal' and 'political' pressures which shape them.

4.5.3 Lack of Initiative from the Developer to be more Strategic and Avant-Garde

The interview process revealed that many of the problems and the shortcomings of the precinct can only be resolved at a strategic level by **X05** as the Developer by planning forward. However, during the course of the research, it was discovered that the different operators felt that there was a lack of initiative from the **X05** to take the lead and work towards policy changes with the authorities to facilitate the management of the precinct.

Many of the operators took the initiative to instigate changes by introducing services that they felt were required in the precinct. This was the case of **RP10** who took the initiative to implement a shuttle system in the precinct so as to facilitate the gravitation of daily users to his commercial centre:

> ***RP10**: I realised that the Cybercity may be small but it is a long way to walk from the bank to here. So I wanted to facilitate people's journey. Then there were the street vendors. People working at the food courts complained. If they are selling the same food, the same product, we have to put the VAT in the price which the street vendor does not have to do. So how will we compete? I was forced to setup a shuttle to facilitate people's route.*

Indeed, several interviewees saw that this could have been an initiative taken up by **X05** in the interest of the daily users of the Ebene Cybercity:

> ***RP09:** If you know the buses' time-table, you can go to lunch at Bagatelle and come back with the shuttle. It's something that could be popularised and harmonised for the masses. For me, it's a potential business which could be subsidised by the government.*

The lack of green space was highlighted to be another shortcoming of the precinct, and again some operators took the initiative to make up for it within their means:

> ***RP07:** No, no…indeed. There are the green areas which are managed by ourselves. There are not a lot, there are 2 or 3. Let me show you on the master plan…*
> ***RP02:** There are companies that create their own green areas. Like see **X02**, it has its own gardens, very well organised and managed.*

It became clear when interviewing the different participants that **X05** has a dual role, one as the Main Developer and one as the operator of its two buildings **B05** Towers 1 and 2. When a new building is in the inception or development stages, **X05** acts as the intermediaries with the different authorities and acts at a strategic. However, the relationship changes as soon as the building becomes fully operational and **X05** refuses to do the management of any common infrastructure.

RP06 recognises that the shortcomings of the Ebene Cybercity can only be overcome through a joint effort of all the different stakeholders and acknowledges the role of **X05** as the instigator in this change.

4.6 Analysis of Key Observations

This section attempts to extract the fundamental elements from the data collected to enable the identification of the key principles of Urban FM being applied at macro level. In this sense, breaking the data collected into separate themes allows for the content analysis to be conducted.

During the data analysis, the FM model from EN 15221-1:2006 with its operational, tactical and strategic levels and Jensen and Due's (2008) model depicting the scope of FM in municipalities were correlated and extrapolated to the scope of FM on a macro level as highlighted above. This was used as a basis for understanding and analysing the data collected. Thus, from the tree diagram depicting the stakeholders' relationships in **Figure 14**, observations could be formulated of how the different stakeholders were contributing to the management of the precinct.

As the analysis of the data collected progressed, the themes that were generated could broadly be categorised into the principles of Urban FM that could be observed as being in application and into a set of criteria that allowed for these principles to be applied in the way that they were.

4.6.1 Emergent Theme 1: Principles of Urban FM at Macro Level

Each organistation operating in the precinct will have its organisational FM operating at a micro level with models similar to those of Chotipanich (2004:370) and Barrett (2000:423) as discussed in **Chapter 2** above.

FM, at a macro level, implies the management of the facilities and infrastructure of the whole precinct. This shows an overlap of Urban FM with the role of Urban Governance as defined in **Chapter 2** whereby formal institutions, informal arrangements and the citizens work in a continuing process to accommodate conflicting or diverse interests and support cooperative action in the common affairs of the city (UN-Habitat, 2015; Curwell, Deakin and Symes, 2005).

From the literature review in **Chapter 2**, Breed (2008) sets forth that in contemporary western ideology, the production of urban space is directed by politics; in the form of 'urban actors' who operate inside the social structures. The interests, needs and diverse contexts of the urban actors, according to Breed (2008), are decisive for appropriate 'decision making in the planning and construction of the urban environment'. The evolution of the Ebene Cybercity has been largely marked by the new strategic projects of the National Government. This could be seen from reviewing the budget speeches of the last fourteen years, from the interview process, the documentary evidence and the statistics provided by the developer, **X05**.

The tree diagram in **Figure 14,** which was derived from all the different interviews and documentary evidence, depicts a generic overview of key players and hierarchy in the Urban Governance of the precinct.

In essence, **X05** is the executive arm of the Government, but is a privately incorporated entity, who owns all the land in the precinct. The operators, who are mainly property developers, have long-term leases with **X05**; some have only one while others hold up to three leasehold agreements, and some operating one building while others have up to six buildings in the precinct. The operators can be sole owners or have partners, the building may be fully owned or floors sold to the different business organisations. These operators might be private entities as well as parastatal bodies and the business organisations occupying the different buildings may be private organisations or public ones as tenants or as co-owners. Moreover, the operators are most often than not the property management agencies or 'syndic'.

From the data analysis, it was observed that FM principles being applied in the operation of the urban precinct emerged mainly at the strategic level. The role of **X05** as an 'urban actor' and its need to be the advocate in resolving the issues and meeting the needs of the precinct with the political powers and policy-making authorities is undeniable. This is shown in **Figure 15** below.

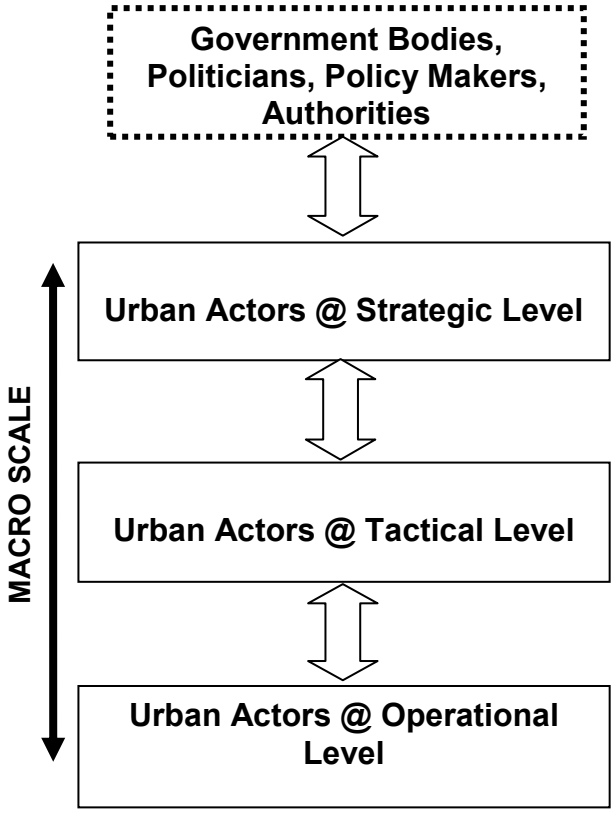


Figure 15: Urban Actors at the Macro Scale

RP10, who operates one of the main commercial establishments in the precinct, explains how his operations were majorly impacted by the road development around the precinct and how his only point of recourse was **X05** to act on the precinct's behalf with the government authorities to push for the development of the required infrastructure:

> ***RP10****: The infrastructure is really important. For example, what really helped us was the round-about linking Ebene to Vandermesh. That road was already planned but fell behind schedule by one year. And when it is late by one year, by the time people get used to it, etc. Now it is jammed. But for a whole year, the road was scarcely visited. People are creatures of habit.*

RP10 points out that these infrastructures inside and on the periphery of the precinct have a major impact on the performance of the businesses but that their development could only be driven from the top:

> ***RP10**: We opened in 2004. And that road was opened in 2005. And in 2006 is when we took off, when I started to break even.*

RP11 is categorical that **X05** should have taken the lead and been more aggressive and bring the authorities concerned at a round table and discuss the different problems of the precinct and find solutions:

> ***RP11**: Parking and traffic are the two biggest problems. It is easily solvable but this cannot be done on the level of the building owners. It's **X05**'s responsibility. Because when they were selling the product at the beginning, they said that there would be enough parking facilities. Now instead of taking action, they are doing nothing. The flyover that was supposed to ease the traffic is itself jammed. You can be stuck for more than one hour. They should have upgraded the road because one lane is not sufficient for all these cars to pass through. Now they are planning to build another flyover coming from Réduit and enlarge the existing one. With flyovers and lay-bys they will solve the problem.*

When questioned as to whether the solutions exist and only await the move from **X05**, **RP11** replies as follows:

> ***RP11**: It's on the government's level. The Road Development Authority has to act. Back in the day, car ownership was a luxury. Now it's a necessity. Everyone has to have a car and be mobile. You can have ten cars for ten employees in any company. **X05** should take the lead…they should be aggressive…there are many problems here…they are not present…*

The project development drivers must operate at a macro scale and can only be guided at a strategic level. Even the creation of the Ebene Smart Community, to resolve the issues with regards to parking, traffic, renewable energy amongst others, as mentioned by **RP06** can only be done if it is strategically guided from the top.

RP07, who mentions the setting up of a FM Office, which does not exist at the moment, to improve the quality of life in the precinct, thinks that the solution for

generating a budget for the welfare system of the precinct could come from the CSR [Researcher's note: Corporate Social Responsibility] budget of the big organisations having their operations in the precinct. Thus, part of their CSR budget could be pooled towards making upgrades in the precinct for the welfare of the users:

> ***RP07**: Since there are high profile tenants spread out everywhere, we thought that we could improve the quality of life here. There are pedestrian, traffic, bus and security problems and we have to improve on those fronts. So these companies have a CSR budget. So...that's what we are trying to do. We have setup the committee and the Ebene smart community will develop in the near future.*

These FM Office or Ebene Smart Community bear a lot of similarities to the Facilities Management Committee (FMC) which has been identified by Michell *et al.* (2016) as being intrinsic in the Community-based FM of a facility. Thus, the FMC or its equivalent in the Urban FM context would need to represent the different stakeholders and help to better the FM service delivery.

RP10 however, questions the limits on the role of **X05**. When asked if **X05** should set up a shuttle system to link all the buildings and points of interest, **RP10** acknowledges the need for it, but queries the funding for same:

> ***RP10:** That's a difficult question. As a tenant, I'd say yes. A member of the public will say the same thing. But you have to put yourself in **X05**'s shoes. Where does its role start and where does it stop? So I cannot answer for them. I would say yes for my part, but who will contribute to finance it? There is a cost.*

4.6.2 Emergent Theme 2: Key Criteria for Implementation of Urban FM Strategy at Macro Level

The second emergent theme from the data analysis was the different key criteria that were allowing the implementation of the pricinples of Urban FM identified above at a macro level. These criteria are summarised in **Figure 16** below and are discussed in depth individually.

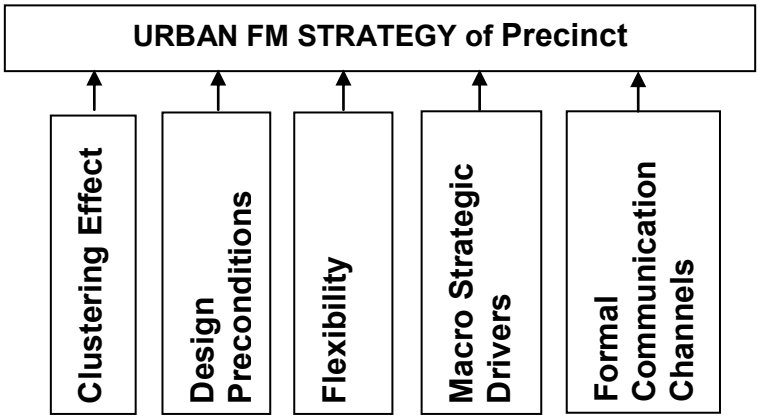


Figure 16: Key Criteria Allowing Implementation of the Principles of Urban FM at a Macro Level

Although the instigating element of the creation of the Ebene cybercity was the goal of developing the ICT sector as a pillar of the economy of the island, the precinct became the platform for more commercially oriented business development over time. This observation is summarised by **RP10**:

> ***RP10:*** *If we had given the project to a private promoter, he would have developed the site 100% commercially. With offices and commerce. But it's the case now too. In the beginning, companies had to be related to ICT. But afterwards we became more flexible because we realised that we could not fill the site only with companies linked to ICT.*

One noticeable aspect of the Ebene Cybercity was the agglomeration dynamics which reflected the remarks of Scott and Storper (2005) who stated that cities, through their agglomeration dynamics, are marked by the social, political, administrative and cultural dimensions of human life, which affect the form of production and exchange (Scott and Storper, 2005). Indeed, in Ebene there was definitely a phenomenon of like attracting like.

In fact, **RP07** explains that **X05,** acting under the National Government's instructions, built **B05** largely to attract investors' and showcase the potential of the precinct:

> ***RP07**: No, no. **X05** has constructed **B05** to get the ball rolling. When we did this, the others started to follow, because initially we need to persuade the investors to come here.*

Thus, each major strategic goal announced by the government, from being the ICT outsourcing destination in the region to being the first knowledge economy in Africa to becoming the gateway for Africa in the financial sector (TEC, 2012; Empinat, 2015) attracted the respective investors and organisations to the Ebene Cybercity because of the infrastructure that it could propose.

Melvin (1992) made the remark that the most impressive aspect of the Canary Wharf (in London, UK) at such massive scale was the variety of practical and physical details that were synthesised in the urban design concept and in the visual impact in order to attract tenants. The construction of **B05** and marketing its merits as an intelligent building were strategies to attract operators and tenants to the precinct similar to those of the developers of Canary Wharf.

From the interviews and the documentary evidence, it could be seen that there are four major sectors which operate in the Ebene Cybercity as further discussed below. **RP07**and **RP11** enumerate the different sectors in which their tenants operate:

> ***RP07**: Mainly in ICT. But ICT is a vague term. Some are into BPO, KPO, call centres, software development, training and even some government bodies. The online centres of the government are housed here.*
> ***RP11**: You have a mix of everything. Education, BPO, off-shore, banking, insurance companies.*

1. Public Bodies

One big sector identified as densely agglomerated in the Ebene Cybercity is the public bodies in the form of ministries. This was a deliberate move that was pushed for by at the highest political levels. Indeed, this clustering at such a large scale was largely induced from a Strategic Development Plan that comes from the highest level. In the context of the Ebene Cybercity, the driver is the National Government itself who geared and promoted the Ebene cybercity's development in these directions.

2. ICT-based Organisations

The goal of the National Government to transform Mauritius into a 'cyber island' and making the ICT sector the fifth pillar of the economy is what promoted the creation of the Ebene Cybercity. As such, there was a major influx of businesses operating in the ICT sector into Ebene from its very creation.

3. Services (Banking, Finance, BPOs, Management Companies, Call Centres)

The third big sector that has agglomerated in Ebene is the services sector encompassing banking, finance, BPOs, Management Companies, Off-Shore companies, Call Centres amongst others. This has been the result of the collaboration of the public and the private sectors to make Mauritius a platform for the financial services sector, ICT and BPO (Stoler, 2005; Benoit, 2015). Thus, the supporting legislation for offshore banking introduced in 1991, supplemented by lower tax rates for particular types of bank, led to a rise in the ICT-BPO based enterprises in the country and in the precinct. In mid-2004 there were twenty-two authorised banks operating in the country, ten under a category-1 licence and twelve under a category-2 licence, in 2012 there were over 575 ICT-BPO based enterprises in the country, and in 2014 there were 11,574 off-shore companies holding GBC1 licences and 14,090 enterprises holding GBC2 licences. The majority of the business organisations in the Ebene Cybercity are from the service providing sector.

The evolution of the ICT-BPO space from 2004 to 2012 is shown in **Figure 17** below.

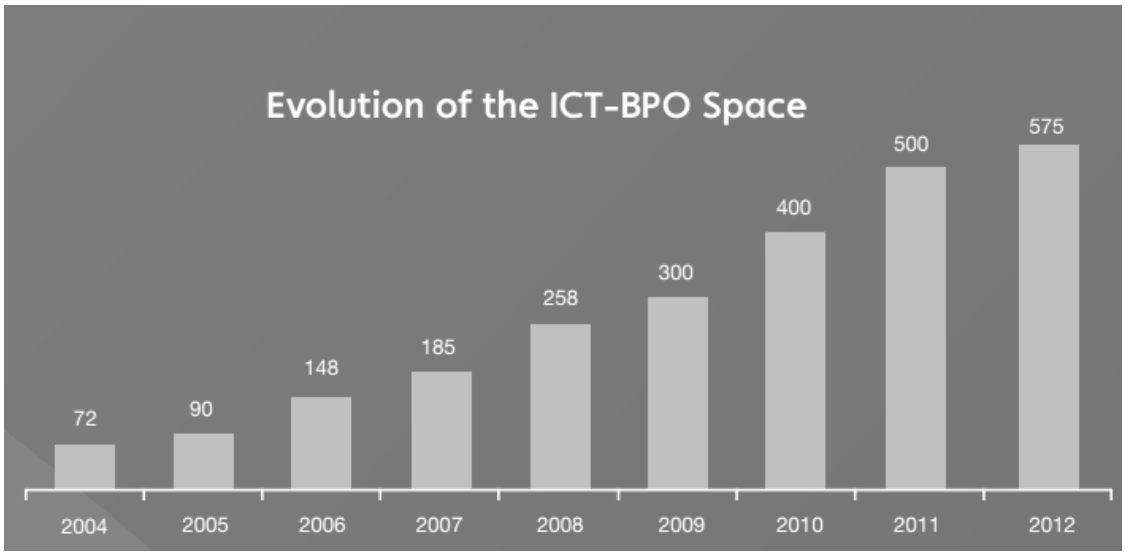


Figure 17: Evolution of ICT-BPO Space

Source: Mauritius Board of Investment (2012:2)

4. Education Hub – Tertiary Education

From 16,735 enrolment in 2000 representing 15.1% of total tertiary enrolment in the population aged 20 to 24 years to 45,969 enrolments representing a ratio of 45% in 2011 (TEC, 2012), the tertiary education sector has known a lightning rise in the last fifteen years with Mauritius positioning itself as an education hub or a knowledge-based economy. **Table 5** summarises the evolution of the Tertiary Education Sector providers according to the statistics from the Tertiary Education Commission as at end of 2012. The rise in this sector on a national level directly impacted the dynamics of operators in the Ebene Cybercity and in 2015, there were 19 learning providers operating in the Ebene triangle.

Table 5: Evolution of Tertiary Education Providers in Mauritius

	1968	2000	2012
Publicly Funded	1	8	11
Private Institution		34	60
Total Education Providers		42	71

Adapted from TEC (2012)

Alignment in the Infrastructure Requirements

With regards to the IT, accounting and education hubs that have found their niches in Ebene, **RP09** makes the following observations which concord with the fact that the core objectives and physical requirements of these sectors align:

> ***RP09:*** *Well if they chose those three aspects, it's because they are the easiest aspects to setup. Today, there are tens of different functions for BPOs. In Ebene, there could be twenty unique functions of BPOs. From medical devices made in Mauritius, then exported, to video conception, to pure IT. Even in IT there are five to six branches. The developer, automation, etc. The same is true for accounting. Some companies will do only cash recovery, auditing, etc. The three that stand out, the four I should say, audio-visual being the fourth one, everything from video manipulation to web design. Those four which are present at Ebene…*

The alignment of the core objectives of the organisations operating in the different sectors allowed for the application of an FM strategy at a macro level. Thus, instead of aligning itself to the aims and objectives of one single organisation and dealing with the discrete problems of single buildings as FM would do in its orthodox practice as highlighted by Melvin (1992), in the Ebene Cybercity, the principles of FM could be applied at a macro urban scale.

This clustering effect is also what allows the precinct to be economically sustainable. The answer from **RP01** who is at a management position in **X01** about the motivation of **X01** to move all its operations to Ebene provides further confirmation that the economic sustainability of the precinct comes from its very size and how the clustering effect is a self-promoting phenomenon.

> ***RP01****: Since some part of our business was already there and also there was no other business park that could accommodate this volume*.

This is further confirmed by **RP02**.

> ***RP02:*** *The fact that there are a lot of private companies that have dealings with each other in such close proximity, auditing firms, banks, offshore companies etc. It is a big advantage. For example if you have auditors visiting offshore companies, there is no need to travel far.*

i) Interaction and Interconnectivity of Key Players

According to Brandon and Lombardi (2011), the increasing spatial boundary of the sustainability agenda entails an increasing level of complexity and the collaboration of a growing number of actors. This was confirmed from the interviews with the different research participants which identified the threads of a complex relationship between the different stakeholders in the ownership system.

This complex relationship between the stakeholders has a direct impact on the management of the services and infrastructure of the business organisations, the buildings and the common spaces and thus, the precinct as a whole.

From the interview process, and the tree diagram derived in **Figure 14**, it could be seen that the different stakeholders thus operate at different levels in the hierarchy of the ownership system. In the management of the premises, the occupants of the buildings, in the form of their facilities managers, and the property management agencies, in the form of the building managers, have functions at the operational level. The operators who own the buildings play an interface between the

occupants and the main developer. Thus, they are players at a tactical level since they would physically translate the vision and strategies of the main developer and they are the channels through which the needs of the occupants are taken care of.

Higher up in the hierarchy in the Urban Governance of the precinct, there is **X05** himself who is the player through which the government translates its vision for the development of the precinct and the spokesperson of the needs of the precinct stakeholders to the government. From the answers of the different interviewees, it was observed that the communication flow was smooth and clear between the operational and tactical level*:*

> ***RP09****: Exactly. Be proactive, be close to the landlord, listening to him, and look at how we can work in the best conditions because I think that is the key to working rapidly and not working in silos which has never worked.*

When queried about how the relationship between the different tenants of a building and the building manager works, **RP08** explained the procedure to be followed in case of any problem in the building:

> ***RP08:*** *Well, we call him, and if he is busy, he would not pick up, but logically we would follow up with an email and he would relay it to the people concerned.*

These formal communication channels were also noted by **RP09** who explains that there are regular meetings with the landlords to resolve problems or communicate the needs of the organisation:

> ***RP09****: In fact, we do have a meeting in which we include the landlord, regularly on a monthly basis or promptly if we have a problem with him, if we have to do a modification, put up a signage, we go to the landlord.*

However, **RP09** points out that the nature of the relationship between the tenants and the landlords vary according to whether the landlord is a private or public entity. **RP09** explains that the request for and implementation of changes are done

more efficiently with a private landlord whereas the procedure is more tedious and time-consuming with a landlord from the public sector:

> ***RP09**: If they are landlords that are in the private sector, for example like those of **B01**, it is much easier to approach them as they own the business. On the other hand, for buildings like **B02** and **B05**, which are owned by the government, there is a hierarchy to follow. The building manager is just an executive; he is a point of contact. But the decision will be taken by the Permanent Secretary at the appropriate ministry or whom it may concern. There is a gap, it's not something that will be done rapidly. If tomorrow, there is change to be done, something to be implemented, consequential works to be done in a building, we would have to start early in if it is in a governmental context.*

According to Alexander (1992), the effective implementation of FM will require the identification of the differences in the organisation's objectives, its culture and its management style. Thus, as stated in Chapter 2, Alexander (1992) argues for a need to distinguish between the different types of organisations and compare their corporate behaviours and driving objectives since the main difference between private sector organisations and public sector companies indeed lies within their objectives. However, in the urban context at a macro level, both public and private organisations will have their operations in parallel and the macro FM strategy will need to be flexible enough to cater for the needs and objectives of both. Indeed, this is only possible because the FM strategy at the macro scale does not intrude upon the operational FM of the different organisations at its micro scale.

The opposite is also true as explained by **RP11**. If the tenants are entities from the private as opposed to the public sector, the relationship is different as well:

> ***RP11:** If on a floor, we have a government body as our tenants, there is a lot slackness in reporting any problem…thus this may drag on…but we do our best, we do routine checks and we make sure that anything not working is fixed…*

As opposed to the smooth and open communication channels between the operational and tactical levels, there seems to be a communication breakdown

between the tactical and strategic levels. Thus, many different operators deplore the fact that there is no response from **X05** with regards to their needs and demands as operators and building owners:

> ***RP10:*** *There is a lack of coordination. There are so many activities taking place at the same time. Well originally, the cybercity was something linked to IT, but now it has become much more commercial oriented*.

RP11 states that it is not the role of the different operators to approach the different authorities to look for solutions to the problems of the precinct:

> ***RP11:*** *If I go to the RDA* [Researcher's note: Road Development Authority] *and I tell them the cybercity has this problem, or that problem, let's find a solution, they will look at me and tell me, why are you not going through* ***X05****? Talk to* ***X05*** *and* ***X05*** *will talk to us…We don't deal with you…*

ii) Flexibility

It was clear that the different building operators have to be flexible to meet the different requirements of their tenants. Indeed the tenet is that the tenants hold the power, the owner has to be flexible and this philosophy was reflected both in the answers of the operators, the building managers, the organisations' facilities managers and the users themselves.:

> ***RP09****: Today, the landlord in general has no choice. If he wants us to stay in his building, he has to provide the facilities, he has to be flexible, he has to be cooperative. If he is unwilling, there is a risk. Even if we have a contract, there is a risk that we could leave, a risk of escalation. A tremendous pressure on the landlord and his team. It is in his interest to keep the relationship easy. On our part, it is in our interest to enlighten him and give a good visibility of what we need, of what we expect of him, well in advance*
> ***RP06:****. And each time a client moves, the requirements will change.*

This flexibility was even witnessed during the construction phase of the building when the organisation of **RP08** was going to buy one floor:

> ***RP08**: Modify it and rehabilitate it..? No, we did not have to. Actually, when the building was going up, at that time, we had decided to buy into it, to buy this floor. So, the floor was built to our requirements, our plans.*

As an operator, **RP11** acknowledges this pressure that exists on the landlord to be flexible and bend over backwards to accommodate the client:

> ***RP11**: We are flexible on everything. We have to satisfy the client. But to a certain limit. The limit is cost-implication. Let's say we have a new tenant tomorrow and they want three cubicles or whatever on their floor. If it is not consequential, our in-house QS will do a cost assessment. If the cost is significant, we'll tell the client that we are renting the space as is, but if they are agree there is a cost-implication in order to modify the space to their convenience. We can also rent in the new buildings "shell and core". They can do their own fit-out if they want to. But mostly, we do that for them because we have team for that.*
> ***RP01:** There are some buildings which have only one conduit for the cabling. Thus, if we need to put in an additional for Business Continuity Management, there isn't. We need to install it at our own costs or we need to get the landlord to modify his building to install this.*

The reactivity of the different operators to find solutions to their tenants is very important:

> ***RP08:** We were among the first tenants here…and when the others started coming, there were some problems that were created such as parking…there were tenants who would not have sufficient parking and there were visitors coming in who could not get parking. These are small management problems but with time they have started restructuring…as the problems crop up, they work to find some solutions….*
> ***RP11**: Yes, so what I do is monitoring of everything, follow-up. I have to maintain the building in good running condition. Because the tenant when he is paying the rental and the syndic fee, the building must be in good running condition and there*

> *should not be any power cut off, and there is no power in the building and the generator did not kick in!I need to make sure that any point in time, whatever happens, I must be here…I need to find the solution…Or find a temporary solution while waiting for the specialist service provider. Because it is all about the service. I cannot take a rental and a syndic and I don't deliver the service back. Because this what I do, I monitor these teams.*

Many of the big corporate structures in Ebene rent space in different buildings.:

> ***RP09****: Exactly. In fact, we occupy four different buildings. Four buildings directly and one more as a backup. We have two buildings occupied by people doing accounting...BPO…and two more by people doing IT,* ***B01*** *and* ***B02*** *and* ***B05*** *for operations.*

This observation is a reflection of what was noted by Melvin (1992) in Chapter 2 during his depiction of the Canary Wharf where the developers had laid emphasis on building the infrastructure to be flexible and allow the tenants to develop systems to their own specifications in their office space.

RP09 also provides much insight in the challenges of the micro FM aspect when the business organisation is spread over different buildings with different owners:

> ***RP09****: A multi-building concept never crossed my mind because for me, once it is clear in my mind, with what I have to do and what the standards are and the staff I need, the rest is just monitoring. Well, it is true that when we talk about four different buildings, they are not identical, they do not have the same age…*

Thus, **RP09** highlights that the key to a successful tenant-owner relationship is adaptation to different mentalities:

> ***RP09****: The towers 1 and 2 of* ***B01*** *have the same owner.* ***B02*** *has another owner and* ***B05*** *has another one, the former owned by a pension fund and the latter owned by the government. So three different owners, three different mentalities, etc. And that is the biggest challenge.*

RP09 highlights that dealing with the expectations of the staff working for the same organisation but in the different buildings is what makes it challenging for the Facilities Manager:

> ***RP09****: […]For them, we were supposed to have three or four uniform and identical buildings. The same for the service. But different people work at those buildings and so the human approach is different, etc. That is more of a problem than the volume.*

iii) Impacts of the Design Stage

The Ebene Cybercity was developed based on a Master Plan as per **Appendix H.** However, **X05** had never envisaged an overarching management body to holistically manage the precinct. In fact, **RP06** very categorically makes this statement:

> **RP06**: All the plots have been allocated, and it is up to the owners and the tenants to look after their assets.

The lack of design preconditions to allow for a formal FM strategy was seen as a big barrier to the implementation of a macro FM strategy. The FM strategy observed is a *de facto* strategy that has settled in place but was a not a preconceived plan for the development and operation of the precinct. However, **X05** was rethinking its position on the matter of managing the precinct and its role as the problem solver with the talks of creating an Ebene Smart Community:

> **RP06**: *no no there is no syndic here…We will create an Ebene Smart Community…And it's from there that we will tackle some common problems such as traffic, landscaping, management of waste and renewable energy.*
> ***R01****: Right now, this does not exist?*
> ***RP06****: No, this does not exist, but it is coming as part of the Smart City concept. So, we are trying to build a Smart community.*

Moreover, with the parcelling out of the lands, in effort to maximise the buildable and rentable area, **X05** neglected the provision of green spaces. **X05** also did not plan for the integration of commercial outlets to cater for the day-to-day needs of the users of the precinct:

> ***RP02****: What is missing is the small retailers, the small corner shops where you can easily buy something without having to go the hypermarket or the towers that have their small integrated snack shops/restaurants where you are going to get it pricey.*
> ***RP09:*** *The second thing missing at Ebene is planning for the masses. All the land you see around you belongs to* ***X05****, to the government. All these plots of land are on lease. The government should have realised that in the future there would be so many buildings. And with buildings, that there would be so many people here. There are from 18000-20000 here. They should have thought of other infrastructure.*
> ***RP03****: There could have been more open spaces...*
> ***RP10:*** *there are no trees to provide some shade for pedestrians. People have to walk under the hot sun*.

Indeed, although there was a Master Plan from the onset of the project, the development of the precinct seemed to have snow-balled out of the control of the developer. This is confirmed by **RP07's** statement about how quickly the precinct attracted investors:

> ***RP07:*** *So, this took on such huge proportions within two years all the…one year all the plots were taken up, there was such a big demand that we could not meet the demand..*
> ***RP09:*** *They did not see the future with a global vision. They thought that it would never grow to such an extent. Then, surprise, there are 20000 people. They thought on a micro-level, saying, you have a small plot of land, do whatever you can with it.*

The perceptions of the daily users of the precinct about the lack of planning and coordination in design are translated in the comments below:

> ***RP02:*** *It could have been better. It could have been better designed, in terms of the streets etc […] Rather, it feels like when the towers were going up, they all seem to pile on each other, and the directions in which they are each facing were not looked at, some look this way, some the other and there were no central organisation, of how the Ebene Cybercity should look like.*

> ***RP01**: It feels like there were no real City Planning done at the time. It feels like plots of land were sold to some individuals and they all built their individual homes as they wanted, in terms of height, look etc. There does not seem to be a harmony.*

RP10 states that indeed, from the very inception, the visions of both **X05** and the different operators themselves were limited and did not span the long term development of the precinct:

> ***RP10:** …the way the cybercity was conceived, the concept is not bad but the fact that the commercial centre was found in the centre of the cybercity and did not have an access on the motorway for example linking Reduit-Rose Hill or Reduit-St Jean, the supermarket was hemmed in. One needed to come in the centre of the cybercity...that was my weakness, that was why it took so long to take off.*

4.7 Concluding Thoughts

This chapter outlined the findings made from the case study of Ebene Cybercity which has provided the platform on which the researcher could investigate how an Urban FM strategy can be implemented at a macro scale to allow for the operation of a sustainable urban precinct. Using themes to classify the data collected, the researcher attempted to uncover the dynamics and relationship between the different stakeholders in the precinct and between the latter and the precinct infrastructure itself. This was done so as to gain further insights into the interplay between the 'buildings, the people and the urban precinct' and deepen the understanding of the implementation of the macro Urban FM at Ebene Cybercity. Therefore, this chapter started by providing information about the local area to better understand the context in which the macro Urban FM strategy is being implemented.

The key features and the major stakeholders were then identified. This was followed by an analysis of the challenges being faced by the Ebene Cybercity as an urban precinct. The chapter concluded with an analysis of the key observations from the findings from the case study. These statements, derived from the

investigation of the urban precinct, lead to the following chapter which attempts to address the research question.

CHAPTER FIVE:
CONCLUSIONS

5.1 Introduction

This chapter concludes the research by answering the research question and confirming the research proposition as well as the fulfilment of the research aims and objectives. This is done by demonstrating the key ingredients that are required to facilitate the implementation of Urban FM at a macro scale and the principles of Urban FM which are actually applicable at such a scale in the management of an urban precinct.

5.2 Research Question and Aims Revisited

The research question created the need to identify the principles and key criteria of the Urban FM strategy that govern the operation of an urban precinct. The case study allowed for the identification of different key criteria which facilitate the application of Urban FM in the Ebene Cybercity and the identification of such FM principles.

From the data analaysis in **Chapter 4** two emergent themes were generated, allowing for the creation of a model to depict the different components of an Urban FM Strategy as it is applied in the local Mauritian context. This model is the result of an amalgamation of the tree diagram showing the stakeholders and their dynamics as identified in **Chapter 4** and depicted in **Figure 14,** the models from EN 15221 (2006) and that from Jensen and Due (2008) as discussed in **Chapter 2** and the observations made in **Chapter 4**. Two key aspects are described in the model as shown in **Figure 18**. The model first identifies the different principles of the FM strategy operating at a macro level. The second part of the model identifies the key criteria which provide the premise for the implementation of the FM Strategy as was observed to take place at the macro scale.

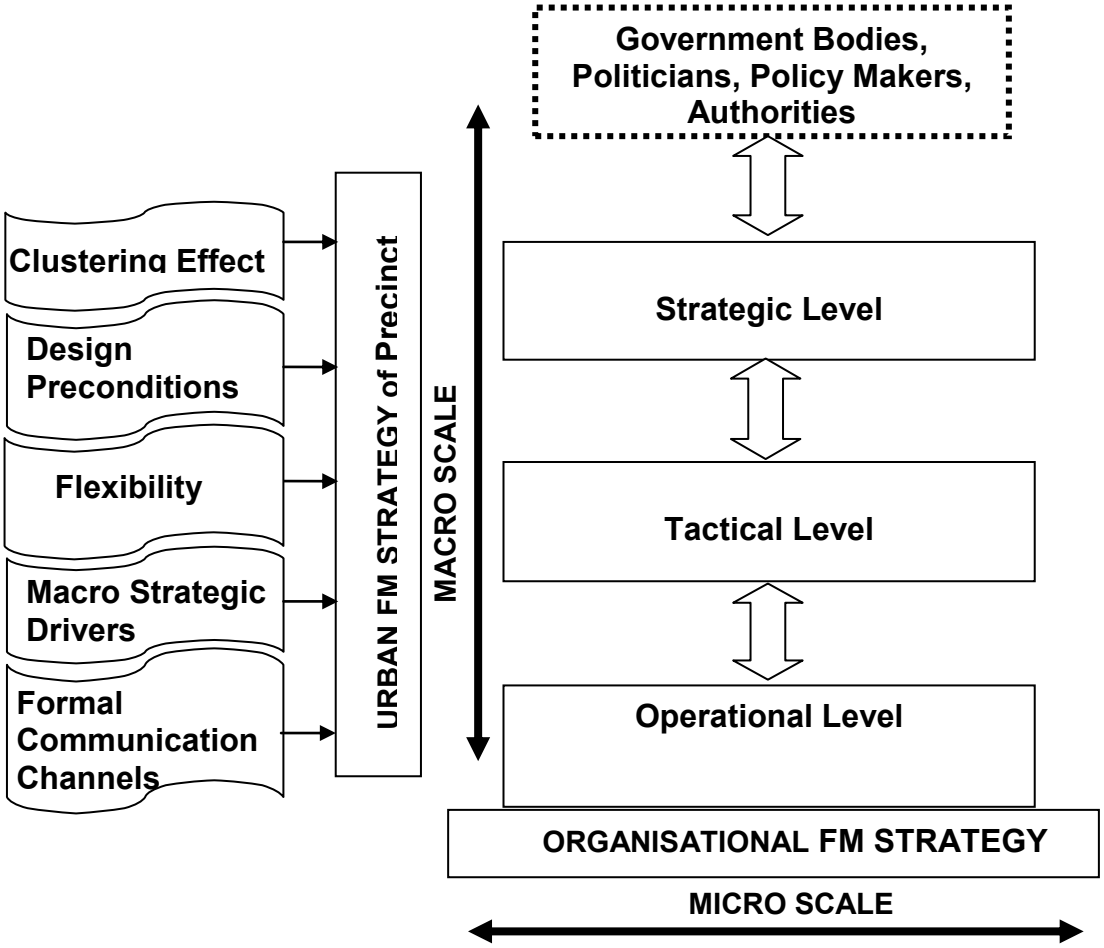


Figure 18: Key Components of the Urban FM Strategy

The two aspects of the model generated from the analysis of the data collected are further discussed below.

5.3 Identification of the Key Principles of the Urban FM Strategy

The Urban FM strategy takes place along two axes in the precinct; at the macro scale and the micro scale. Each organisation operating in the precinct will have an FM strategy to match their in-house policies and topical day-to-day requirements and operations. This FM occurs at the level of the organisation at a micro scale and meets the narrow definition of BIFM of FM which takes place within an organisation. This micro FM operates on a purely operational level in the Urban FM context.

The second axis runs vertically along the hierarchy of the precinct stakeholders, as depicted in **Figure 14**, and allows the implementation of an Urban FM strategy at a macro level through the different stakeholders. From the research findings, it can be said that this Urban FM strategy spans three levels namely the operational, tactical and strategic level. However, although there is evidence of all three spheres of FM at a macro environment, the findings highlight that the scope of Urban FM at a macro scale is mainly at the strategic and tactical levels. In fact, as observed in section **4.6.1**, the macro FM strategy is mainly driven at the strategic level.

There are certain principles of traditional FM that have not yet been identified as directly transferrable to a macro scale. Urban FM at the precinct level has little to do with the lower end of the hierarchy where operational tasks are performed within the organisations. However, each strategy informs the other up and down the hierarchy of stakeholders and the overall Urban FM strategy.

The depiction of the FM strategy as applied at the macro scale follows from the observation of the key role players identified in Chapter 4 and their functions in the implementation of the strategy according to their position of the overall ownership hierarchy of the precinct.

The research outcomes, finding echo in Jensen and Due (2008), showed that it is important for the implementation of an FM plan to have a strategic awareness and support at top level of the structure being managed; involving both the political leadership and the top management of the urban precinct. The FM implementers should be proactive and optimise the development strategies in accordance with the political intentions for the development of the precinct, based on a holistic view, and with focus on the needs of the users on both short and long term.

5.4 Identification of the Key Criteria for the Implementation of an Urban FM Strategy

5.4.1 Key Criterion 1: Clustering Effect

One of the key criteria identified as facilitating the implementation of the Urban FM strategy at the macro level was the clustering of the same business types in the precinct. This was observed as being extremely important because it allowed the infrastructure requirements of each of the businesses to match. The clustering effect allowed for the agglomeration of businesses and the alignment of the core objectives of the different organisations that operate within the precinct. From the research findings, it was fair to conclude that the clustering effect is also in fact what allowed the precinct to be economically sustainable because it had a gravitational effect on the different businesses operating in the same sector to the precinct.

5.4.2 Key Criterion 2: Flexibility

In Chapter 2, Heywood and Smith's (2006) argument that the gap between the expectations and the needs of the stakeholders need to be closed so as to achieve a better FM service was noted. Alexander's (1992) statement that differences in context must be identified in order to effectively deliver the 'operating environment and services' required was also reviewed. The observations made in Chapter 4 align with these statements and it can be concluded that this flexibility in the Urban FM is essential for its operation at a macro scale. This is in line with the observation made by Melvin (1992) in the case study of Canary Wharf. In the Ebene precinct, it can be concluded that, at the tactical level, the flexibility of the operators to meet the requirements of the business organisations is a precursor to the establishment of the FM policy at macro level. At the operational level, it is a requirement for the organisation's FM policy at a micro level to adapt to having their operations in different buildings and with different operators.

5.4.3 Key Criterion 3: Formal Communication Channels

Previous research findings, as catalogued in Chapter 2, indicate the necessity for interaction, inter-connectivity and integration of 'facilities, services and precinct stakeholders' and through communication and interaction between stakeholders (Michell, 2013; Heywood and Smith, 2006). This is confirmed by the research findings where the inter-connectivity of the different stakeholders acting at the different levels of Urban FM hierarchy has been identified as being an integral element of the operation of the precinct. This creates the need for formal communication channels, the lack of which can lead to communication breakdown and the needs of the different stakeholders not being heard. This element is closely linked to the need for the landlords to be attentive to the requirements of their tenants and be flexible in providing the support service to the different business organisations and for the latter to clearly communicate their needs. Higher up in the hierarchy, the communication should be formalised between the different operators and the main developer. This is very important, because the operators are the bone and marrow of the precinct and are the physical developers of the infrastructure. Thus, to guide the development in the direction that the developers require, communication lines via the main developer to the political players and 'urban actors' must be open.

5.4.4 Key Criterion 4: Design Preconditions

The research findings highlighted the multi-disciplinary aspect of FM because it was observed that a functional FM strategy during the operation of the precinct share an interdependent relationship with the disciplines of urban development, urban governance, urban management and urban sustainability. Thus, it was found that the foundations for a macro FM strategy should be laid at the design stage itself where the design stakeholders should be the proponents of an overarching FM strategy during the operation of the precinct. This was not the case for the Ebene precinct where there were no plans for the precinct's common

infrastructure and strategic development to be holistically managed by one entity, be it by **X05** itself or a committee with representatives from the different property developers operating in the precinct. However, with the potential creation of an FM Office or of the Ebene Smart Community, the urban FM stratey will probably be formalised. The DNA of this Smart Community will be very similar to the FMC, i.e. the FM Committee, which has been identified by Michell *et al.* (2016) as being a key pillar to Community-based FM.

5.4.5 Key Criterion 5: Macro Strategic Drivers

The interview process revealed that many of the problems and the shortcomings of the precinct can only be resolved at a strategic level, be it for resolving parking issues, traffic problems or making the precinct a pedestrian zone. Indeed, within the precinct and the established hierarchy of the stakeholders, it is not within the control or the scope of the business organisations to drive the urban development strategy. The strategic drivers, as the forces that shape the development strategy of the precinct, were not witnessed at an organisational or micro level but were observed to happen or have the potential to happen higher up in the management and ownership hierarchy. A lack of such strategic drivers for the macro development was seen to inhibit a deeper application of Urban FM.

From the research findings, it could be concluded that for FM to operate at a macro level, macro drivers must be at a strategic level so as to allow for the alignment of the political intentions, the National Government's development goals and needs of the stakeholders of the precinct. In fact, in the context of the Ebene Cybercity, the main driver is the National Government itself. The research findings are therefore in line with Alexander (2006) who states that FM aims to provide 'strategic direction', delivery of services and added value to society and must incorporate social, economic and environmental benefits.

5.5 Research Aims and Objectives Revisited

The aims of the research, in a condensed form, were to identify the key principles of Urban FM that are applied at a macro level to operate a sustainable urban precinct and the key ingredients which create the platform to enable the implementation of this Urban FM strategy in Ebene Cybercity, Mauritius.

In this sense, clustering and agglomeration, flexibility, formal communication channels, design preconditions, as well as macro strategic drivers have been identified through the research as the prerequisites which lay the grounds for the successful implementation of an Urban FM strategy. The elements of such a macro Urban FM policy have been identified to happen only at the strategic and tactical levels of the precinct structure and set-up.

The main objectives of the research were to use the case study of the Ebene Cybercity to examine the operation of an urban facility in the context of its FM from a macro perspective in order to carry out the following:

- Identifying the key role players in the operation of the urban precinct,
- Identifying the key criteria facilitating the implementation of Urban FM at a precinct level, and
- Identifying the critical FM principles being applied at the scale of the urban precinct.

The research, over chapters four and five, build on each other to fulfil the above objectives. In this sense, it can be concluded that the key criteria allowing the implementation of Urban FM at a macro level for a sustainable urban precinct and the key principles of such an Urban FM strategy can be identified within the context of the case study.

5.6 Reliability and Validity of the Research

Internal validity relates to the issue of correlation and causality where it is determined whether the research 'findings relate to and are caused by the phenomena under investigation and not other unaccounted for influences' (Winter, 2000:11). Validity in qualitative research also partially requires an internal validity, but is not centrally concerned with causality, and does not drastically seek to isolate and categorise the particulars within the phenomena (Winter, 2000). The findings of the research clearly show the correlation between the different facets observed in the operation of the precinct and the implementation of the Urban FM strategy at a macro scale. Hence, the conclusions and relationships established from the data analysis may be seen to be internally valid.

The measure of external validity is the extent to which the results can be generalised and thus applied to other populations, however, according to Winter (2000), external validity is often of no importance to qualitative research and seeking to achieve it may compromise its overall validity. Consequently, qualitative findings are best generalisable to the development of theories and not wider populations. The findings, in this sense, cannot be generalised to populations or universes through statistical generalisation but can be applied to expanding and generalising theories (Yin, 2003). Thus, in relation to contextual dynamics common to this case study, the findings do possess some elements of external validity but as it is a single unique case study, the findings may not be seen to be completely generalisable..

Overall, as encouraged by Schutt (2009), careful consideration was given to the evidence and methods on which conclusions are based and throughout the course of a study, the findings were continually verified. Hence, self-reflection and theoretical thinking as advocated by Miller (2008) were applied to enhance the the notions which correspond to the criteria for good research as iterated in Chapter 3.

5.7 Contribution to Knowledge

This study tries to answer the call for an improved understanding of the relationship between buildings, people and the urban precinct by Michell (2013) to facilitate the development of an increased understanding of sustainable urban precincts. It builds on the existing body of research on traditional FM and emerging Urban FM and works towards the establishment of an urbanised FM research agenda as appealed by Larsen *et al.* (2011). The findings corroborate Jensen and Due (2008) and find echo in Michell's (2013) statement with regards to the overlapping of many different disciplines in the study of Urban FM sustainability.

Ebene Cybercity is a unique case, in terms of its contextual background and therefore, the contribution of the findings from the investigation to the field of Urban FM remains limited. However, the findings and conclusions of this research can be applied to future developments with similar contextual ingredients. In this sense, there is scope for future research in the African context with its 'low level of urbanisation', and African towns and cities generally, with their 'low installed infrastructure base', as argued by Abbott (2012) who highlights the need for a new infrastructure model firmly anchored in the sustainability principles. Indeed, this resonates with the AEO report 2016 which states that urbanisation is a megatrend which is profoundly transforming African societies and which recognises the scope for 'new, wide-ranging urban policies to turn African cities and towns into engines of growth and sustainable development' (AEO, 2016).

In the Mauritian context itself, with the initiative of *smart cities* to be implemented in the coming years, the findings from this research can be used to engage the stakeholders at design stage itself into a reflective and *ex ante* debate.

5.8 Concluding Thoughts

The purpose of this study was to determine the elements of an Urban FM strategy that can be applied at an urban precinct scale to ensure its sustainability. This was accomplished through an extensive analysis of the existing literature and the data

collected through the case study methodology. Through the study, a list of ingredients that can facilitate the implementation of such a strategy were identified, together with the scope of FM and its different elements applicable at a macro scale. The requirements of these particular facilitating ingredients and the replication of these FM elements in another precinct have not been explored. There is therefore scope for more research in this direction to strengthen the generalisation to theory. Deeper studies in the overlap of the FM principles with other disciplines to allow for the creation of sustainable urban precincts and hence the creation of sustainable urban precincts are also a path that is open to future researchers.

APPENDICES

Appendix A: Generic List of Questions to the Stakeholders

THE DEVELOPER

A About the Interviewee

1 Before we begin, let me reiterate that your contribution to the research is completely on an anonymous basis as explained in the consent form.

2 What is your role in your organisation?

3 How long have you been involved in/worked with/ connected to the area?

B About the Organisation

1 Can you tell me about your organisation and its origins?

2 Your website describes you as "Incorporated in March 2001 as a Government Company to develop and manage business parks".

3 As a State Owned Company, what, then, is your organisation's relationship with the local government and what role does the local government play in the development of Ebene City?

4 Do you consider yourself as a 'mini-municipality'?

5 Do you manage the different buildings that you own as a single entity or as stand-alone buildings?

6 What are the challenges/benefits associated with owning and managing more than one building and the associated public spaces and infrastructure?

7 Is there more land to be developed?

8 Who play the key roles in the planning of new developments and infrastructure in the area?

C About the Buildings and the Precinct

1 What are the geographical boundaries of the Ebene Cybercity ?

2 Do you have maps and archive photos that you could share with me?

3 Is your organisation the sole owner of the different properties in Ebene Cybercity?

4 If not, how was the land parcelled out and what is the legal ownership implications (freehold, leasehold)?

5 Was there an initial development strategy for Ebene Cybercity? (like a Master Plan, or a Vision 20XX)

6 How was it created? Who was responsible for this vision?

7 How was the urban planning of the Ebene Cybercity conceived?

8 Has it been sustained or even adapted?

9 At design state, was there proper provision made for the:

i) Drainage - is the whole ebene cybercity connected to the new underground sewerage system on the island?

ii) Parking

iii) Traffic influx - bus stations, bus stops, shuttle system

iv) IT support - Is there high-speed internet available for the different businesses in the Ebene Cybercity?

10 Do you have any statistics of people working in the Ebene Cybercity and the businesses operating here?

11 Different businesses operate in your different buildings. How flexible are you to meet each business's requirements?

E.g: more stringent Health and Safety policies in the organisation; disability considerations etc

12 Is the precinct affected by the other developments around it or close to it?

13 Do these influence positively or negatively on the sustainability of the precinct?

D **<u>About the Services and Infrastructure</u>**

1 Are the grounds of the Ebene Cybercity private grounds?

2 Are the roads inside the Ebene Cybercity private roads?

3 Who manages the roads, transport and other infrastructure services?

4 Who is responsible for maintenance, improvement and upgrading of services in the precinct?

5 Where does the funding come from for services such as security, marketing/HR, landscaping, maintenance upgrading and cleanliness?

6 Are there charges for the different owners/tenants of the different buildings in the precinct for the management of the common spaces, services and infrastructure?

7 What is the procedure for the procurement of new services such as fumigation in the different buildings etc? Is it by a tendering process, or do you have service level agreements in place with different companies?

8 Is the precinct economically sustainable?

9 Is there an aim in the future for the precinct to become self-sufficient in terms of power?

10 Is there anyone else that you think I should be speaking to?

Appendix B: Ethics Clearance

EBE Faculty: Assessment of Ethics in Research Projects

Any person planning to undertake research in the Faculty of Engineering and the Built Environment at the University of Cape Town is required to complete this form before collecting or analysing data. When completed it should be submitted to the supervisor (where applicable) and from there to the Head of Department. If any of the questions below have been answered YES, and the applicant is NOT a fourth year student, the Head should forward this form for approval by the Faculty EIR committee: submit to Ms Zakiya Chikte (Zakiya.chikte@uct.ac.za); New EBE Building, Ph 021 650 5739). Students must include a copy of the completed form with the dissertation/thesis when it is submitted for examination.

Name of Principal Researcher/Student: HANNA BOODHUN **Department:** Construction Economics & Management

If a Student: **Degree:** Masters in Property Studies **Supervisor:** Ass. Prof Kathy Michell

If a Research Contract indicate source of funding/sponsorship:

Research Project Title: Identification of the Key Urban Facilities Management Principles of a Sustainable Urban Precinct: A Case Study Of Ebene Cybercity, Mauritius

Overview of ethics issues in your research project:

Question 1: Is there a possibility that your research could cause harm to a third party (i.e. a person not involved in your project)?	YES	(NO)
Question 2: Is your research making use of human subjects as sources of data? If your answer is YES, please complete Addendum 2.	(YES)	NO
Question 3: Does your research involve the participation of or provision of services to communities? If your answer is YES, please complete Addendum 3.	YES	(NO)
Question 4: If your research is sponsored, is there any potential for conflicts of interest? If your answer is YES, please complete Addendum 4.	YES	(NO)

If you have answered YES to any of the above questions, please append a copy of your research proposal, as well as any interview schedules or questionnaires (Addendum 1) and please complete further addenda as appropriate.

I hereby undertake to carry out my research in such a way that

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

Signed by:

	Full name and signature	Date
Principal Researcher/Student:	HANNA BOODHUN Signed	25/01/2016

This application is approved by:

Supervisor (if applicable):	Signed	31/01/2016
HOD (or delegated nominee): Final authority for all assessments with NO to all questions and for all undergraduate research.		12/02/2016
Chair : Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the above questions.		

ADDENDUM 1:
Please append a copy of the research proposal here, as well as any interview schedules or questionnaires:

ADDENDUM 2: To be completed if you answered YES to Question 2:

It is assumed that you have read the UCT Code for Research involving Human Subjects (available at http://web.uct.ac.za/depts/educate/download/uctcodeforresearchinvolvinghumansubjects.pdf) in order to be able to answer the questions in this addendum.

2.1 Does the research discriminate against participation by individuals, or differentiate between participants, on the grounds of gender, race or ethnic group, age range, religion, income, handicap, illness or any similar classification?	YES	(NO)
2.2 Does the research require the participation of socially or physically vulnerable people (children, aged, disabled, etc) or legally restricted groups?	YES	(NO)
2.3 Will you not be able to secure the informed consent of all participants in the research? (In the case of children, will you not be able to obtain the consent of their guardians or parents?)	YES	(NO)
2.4 Will any confidential data be collected or will identifiable records of individuals be kept?	(YES)	NO
2.5 In reporting on this research is there any possibility that you will not be able to keep the identities of the individuals involved anonymous?	YES	(NO)
2.6 Are there any foreseeable risks of physical, psychological or social harm to participants that might occur in the course of the research?	YES	(NO)
2.7 Does the research include making payments or giving gifts to any participants?	YES	(NO)

If you have answered YES to any of these questions, please describe how you plan to address these issues (append to form):

ADDENDUM 3: To be completed if you answered YES to Question 3:

3.1 Is the community expected to make decisions for, during or based on the research?	YES	NO
3.2 At the end of the research will any economic or social process be terminated or left unsupported, or equipment or facilities used in the research be recovered from the participants or community?	YES	NO
3.3 Will any service be provided at a level below the generally accepted standards?	YES	NO

If you have answered YES to any of these questions, please describe how you plan to address these issues (append to form)

ADDENDUM 4: To be completed if you answered YES to Question 4

4.1 Is there any existing or potential conflict of interest between a research sponsor, academic supervisor, other researchers or participants?	YES	NO
4.2 Will information that reveals the identity of participants be supplied to a research sponsor, other than with the permission of the individuals?	YES	NO
4.3 Does the proposed research potentially conflict with the research of any other individual or group within the University?	YES	NO

If you have answered YES to any of these questions, please describe how you plan to address these issues(append to form)

Appendix C: Information Sheet and Consent Form for Focus Group Participants

INFORMATION SHEET & CONSENT FORM
UNIVERSITY OF CAPE TOWN
CONSENT TO PARTICIPATE IN A RESEARCH

Focus Group Participants

Research Topic: Identification of the Key Urban FM Principles of a Sustainable Urban Precinct: A Case Study Of Ebene Cybercity, Mauritius

Dear Potential Participant,

My name is Hanna Boodhun and I am conducting a research project towards a Masters degree with the University of Cape Town. The aim of my research is to identify the key Urban FM principles of a sustainable urban precinct by using the Ebene Cybercity as a case study and I would like to invite you to participate in the project.

The research is supervised by Associate Professor Kathy Michell of the University of Cape Town, and the results of the study will be presented to the Department of Construction Economics and Management in fulfilment of the requirements for the degree of Masters in Property Studies.

Purpose of the Focus Group

I am interested in finding out about the user experience of different frequent users of the Cybercity as a precinct. Your participation is voluntary, with no negative consequence and you may withdraw at any time. However, I would be grateful if you would assist me by participating in the focus group.

Procedures

If you volunteer to participate in the focus group, you will be invited to a place that would be suitable for a group where I, myself as the moderator, will guide the discussion that should last around 1 hour with pre-determined questions as well as emergent questions. The data collected shall be used in conjunction with data from

document analysis, photographic evidence and a potential questionnaire under a case study research method.

Consent to Recording & Confidentiality

If you volunteer to participate, please note that the focus group discussions will be recorded and that the transcripts of the discussions will be used as primary data source. However, the raw data of the discussions will only be revealed to personnel directly related to the supervision and marking of this dissertation and every effort will be made to ensure that subjects are anonymous, through a coded labelling of the research participants. It will a priority to safeguard any proprietary information and maintain, to the maximum, the confidentiality of any information gathered which will be used solely for this research purpose.

Rights of the Research Participants

You may withdraw your consent at any time and discontinue participation without any penalty. The study has been reviewed and received ethics clearance through the Head of Department of the CEM Department of the University of Cape Town.
If you have any questions or concerns about the research, please feel free to contact me at hboodhun@gmail.com
The research supervisor, Associate Professor Kathy Michell, may also be contacted at Kathy.Michell@uct.ac.za

Signature of Research Participant/Legal Representative

I have read the information provided for [Identification of the Key Urban FM Principles of a Sustainable Urban Precinct: A Case Study Of Ebene Cybercity, Mauritius] as described herein. My questions have been answered to my satisfaction and I agree to participate in this study. I have been given a copy of this form.

Name of Participant:

Signature:

Appendix D: Information Sheet and Consent Form for Research Participants

INFORMATION SHEET & CONSENT FORM
UNIVERSITY OF CAPE TOWN
CONSENT TO PARTICIPATE IN A RESEARCH

Research Participants

Research Topic: Identification of the Key Urban FM Principles of a Sustainable Urban Precinct: A Case Study Of Ebene Cybercity, Mauritius

Dear Potential Participant,

My name is Hanna Boodhun and I am conducting a research project towards a Masters degree with the University of Cape Town. The aim of my research is to identify the key Urban FM principles of a sustainable urban precinct by using the Ebene Cybercity as a case study and I would like to invite you to participate in the project.
The research is supervised by Associate Professor Kathy Michell of the University of Cape Town, and the results of the study will be presented to the Department of Construction Economics and Management in fulfilment of the requirements for the degree of Masters in Property Studies.

Purpose of the Study

The primary aim of this study is to establish whether the principles of FM can be applied at a macro, urban scale in order to attain a sustainable urban precinct. The research project, by using the Ebene Cybercity as a case study, explores the current practices of FM at an urban level and what infrastructural services are necessary to provide a sustainable urban environment. Your participation is voluntary, with no negative consequence and you may withdraw at any time. However, I would be grateful if you would assist me by participating in the focus group.

Procedures

If you volunteer to participate in the research, the interview, which will last no longer than 1 hour, will be conducted at a place and time of your convenience and

it will based on a list of with pre-determined questions as well as emergent questions. The data collected shall be used in conjunction with data from document analysis and photographic evidence under a case study research methodology.

Consent to Recording & Confidentiality

If you volunteer to participate, with your consent, the interview may be recorded. The transcripts of the interview will be used as primary data source. However, the raw data of the interview will only be revealed to personnel directly related to the supervision and marking of this dissertation and every effort will be made to ensure that subjects are anonymous, through a coded labelling of the research participants. It will a priority to safeguard any proprietary information and maintain, to the maximum, the confidentiality of any information gathered which will be used solely for this research purpose.

Rights of the Research Participants

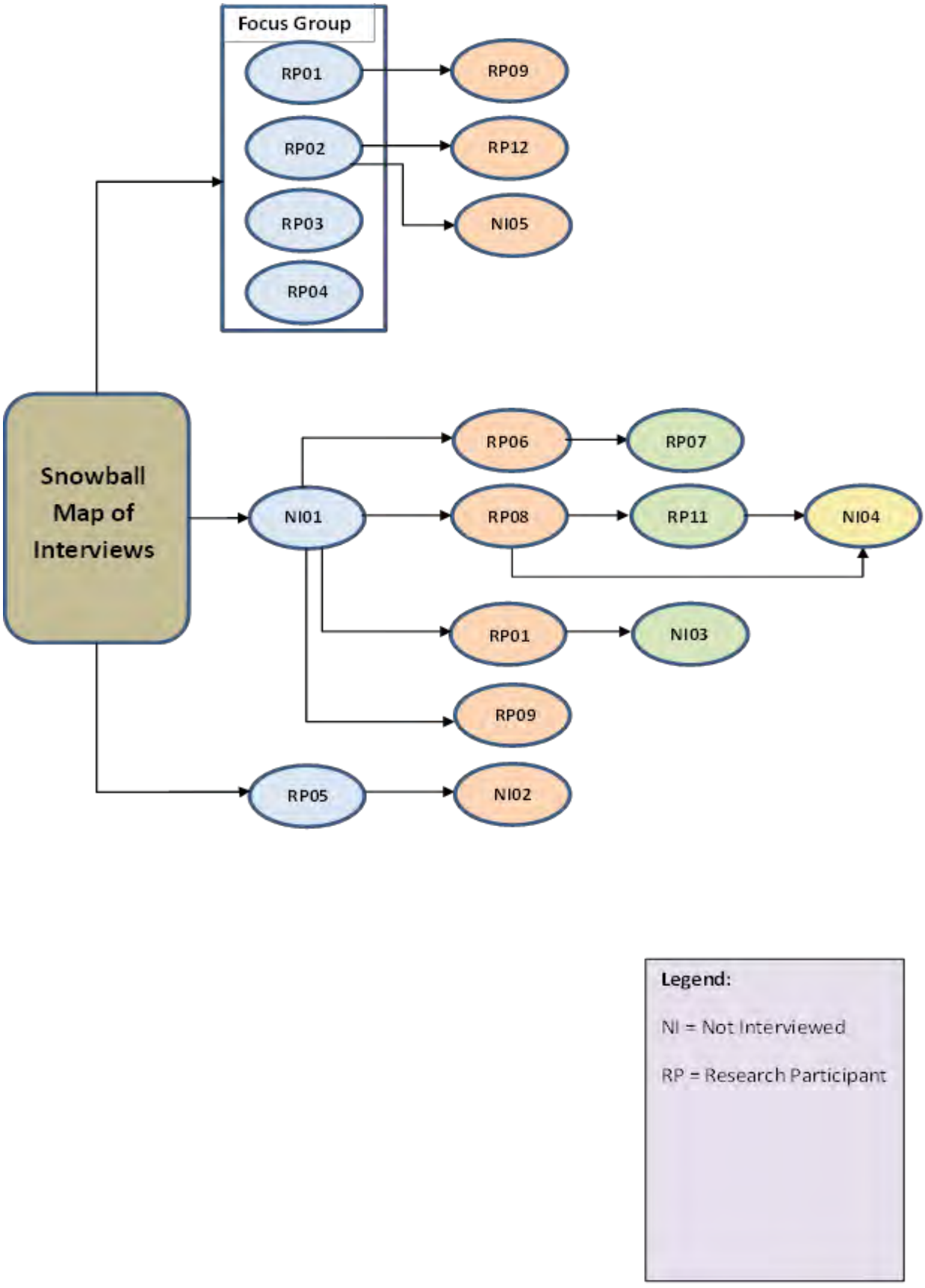
You may withdraw your consent at any time and discontinue participation without any penalty. The study has been reviewed and received ethics clearance through the Head of Department of the CEM Department of the University of Cape Town.
If you have any questions or concerns about the research, please feel free to contact me at hboodhun@gmail.com
The research supervisor, Associate Professor Kathy Michell, may also be contacted at Kathy.Michell@uct.ac.za

Signature of Research Participant/Legal Representative

I have read the information provided for [Identification of the Key Urban FM Principles of a Sustainable Urban Precinct: A Case Study Of Ebene Cybercity, Mauritius] as described herein. My questions have been answered to my satisfaction and I agree to participate in this study. I have been given a copy of this form.

Name of Participant:
Signature:

Appendix E: Snowball Map of Interviews



Appendix F: Sample of Interview Transcript

Interview with RP09

R01: I will introduce myself, my name is Hanna Boodhun. Thank you very much for meeting me. As I told you, my aim is just to collect the maximum amount of information I can get with regards to the Ebene Cybercity and how it is managed for my Masters dissertation. As is said in the consent form, before we start, it's really on an anonymous basis and voluntary and there is no tracking system so you are…umm…your confidentiality is protected.

RP09: Ok…

R01: To start with, please explain to me your role in your organisation

RP07: My role... I'll start by explaining the role of the...

R01: The role of **X01**?

RP07: Maybe not **X01** but the function itself, previously known as "facilities", now at **X01** we have rebranded it as "workplace" with a bigger scope than facilities. When we say facilities for other companies, they stop at specific functions such as buildings, internal infrastructures (everything from chairs, desks, fit-out). Workplace at **X01** encompasses other services, which are not necessarily present in other companies, meaning that we have 5 clusters, the first one being indeed for fit-out, buildings, search of new buildings, everything you see around see in terms of facilities, physical things. The second cluster includes everything from the front office, the reception, transport...

R01: Logistics?

R09: Yes, logistics, and even food. The third cluster at **X01** concerns the financial aspect, the financial aspect for the workplace. It is not a profit making department.

R01: Support service?

RP09: Yes. We provide the services. We have something called WBS which is a code that allows us to rebill the services that we provide, but they are billed at no profit. So all the financial aspect, the budget, CAPEX, OPEX for Workplace. The fourth cluster concerns Health and Safety and Security. Health and safety and security which in other companies is managed by Human Resources or functions through consulting. At **X01**, it is integrated in the workplace function. When we talk about security, it is everything from ISO27K, IT security and physical security. Health and safety is based on OSHA. The fifth cluster concerns travel, meeting and events and corporate housing for expatriates, which does not exist in other companies. This is the scope.

R01: And how long have you been at **X01**?

RP09: I've been at **X01** for 7 months. Initially I was with the company in 2003, and then from 2005 to 2008, I was at **X08** and now I've been here since July of last year for the job of workplace manager.

R01: So how long has **X01** been established in Ebene?

RP09: At Ebene, well I don't have the exact dates. I may not be the best person to answer this question but between 2003 and 2008 when we were at Cassis, it was just the BPO and accounting, the IT department already existed in Ebene. So for the IT department, at least a decade.

R01: Do you know what motivated **X01** to have their operations here at Ebene?

RP09: At Ebene, well it was the nerve centre for IT. It was positioned as such. It was a centre with all the facilities that we could have wished for to develop IT. It was a logical choice for **X01** to come to Ebene.

R01: To my understanding for the moment, your company has its operations in different buildings.

RP09: Exactly. In fact, we occupy four different buildings. Four buildings directly and one more as a backup. We have two buildings occupied by people doing accounting (BPO), and two more by people doing IT where there are 240 people and **B02** and **B05** for operations and we will soon be needing another building as there has been a ramp-up in the company. The fifth one is **B06** which is a Business Continuity Centre (BCP).

R01: Which is at Quatre-Bornes? Are you planning to move part of your operations elsewhere?

RP09: It's only in times of crisis that we plan to move. It's a space that we have reserved in case of an emergency, and the operations shut down in Ebene in the event of a problem at Ebene. Let us that for our clients in Europe or elsewhere, it needs to be transparent. They cannot afford to… if Mauritius has a problem, the business has to continue.

R01: And it is part of the policy of **X01** ?

RP09: Definitely…In any country…Now if tomorrow Mauritius shuts down, it will be a BCP on another country. Another country will provide the service. Each one is backup for the other.

R01: Is this something that you saw in other companies? You said that you worked at **X08**, it exists there?

RP09: For example, at **X08**, which is a French company, it exists. The BCP function exists as a whole. Meaning that we have all kinds of things setup for the business to go on functioning.

R01: So, you are one person, one team, but you function across many different buildings, how does it work in terms of managing those five clusters?

RP09: Actually, what should be done… Actually, we have some people who are shared and some who are dedicated. All the 'shared' people, as the name suggests move between the buildings, especially all the leads, my assistants, who are shared, move around the buildings, to ensure that the process is harmonised, that everything is standardised and harmonised. On the other hand, people who are dedicated, like for example people at the reception desk is dedicated to one building, people who carry out maintenance are dedicated to one building because they know that one building. But even that, we are in the process of making people go round the different buildings. When we say "go round", it is so that monotony does not take hold. Meaning that they are not frozen in one building, that they learn what is done in other buildings, what are the standards in other buildings, what they can improve when they get back to their old building, how they can improve the service. On top of that, we have the leads, who are here to ensure that they have all the facilities possible to do the work in the best possible conditions. My role is to see on the level of the business, how to translate that to day to day execution and see that we are giving the best service, at the best cost.

R01: Do you have building managers in each building, since you are renting those buildings and are not the owners? If so, do you participate in "syndics des bâtiments"?

RP09: In fact, we do have a meeting in which we include the landlord, regularly on a monthly basis or promptly if we have a problem with him, if we have to do a modification, put a signage, we go the landlord. If they are landlords that are in the private sector, for example like those of **B01**, it is much easier to approach them as they own the business. On the other hand, for buildings like **B02** and **B05**, that are owned by the government, there is hierarchy to follow. The building manager is just an executive, he is a point of contact. But the decision will be taken by the Permanent Secretary at the appropriate ministry or to whom it may concern. There is a gap, it's not something that will be done rapidly. If tomorrow, there is change to

be done, something to be implemented, consequential works to be done in a building, we would have to start early in if it is in a governmental context.

R01: Actually, I was getting to this, how flexible do you find the facilities that you use, do they meet your requirements?

RP09: Today, the landlord in general has no choice. If he wants us to stay in his building, he has to provide the facilities, he has to be flexible, he has to be cooperative. If he is unwilling, there is a risk. Even if we have a contract, there is a risk that we could leave, a risk of escalation. A tremendous pressure on the landlord and his team. It is in his interest to keep the relationship easy. On our part, it is in our interest to enlighten him and give a good visibility of what we need, of what we expect of him, well in advance. And for me, my key strength, what has changed since my arrival at **X01**…

R01: That you work proactively?

RP09: Exactly. Be proactive, be close to the landlord, listening to him, and look at how we can work in the best conditions because I think that is the key to working rapidly and not working in silo which has never worked.

R01: Do you find that the facilities in the Ebene precinct meet your requirements in terms of internet speed, parking facilities, everything that you need…

RP09: Well, today… Internet speed, yes. Because in general, Ebene is the best served region in terms of the internet. Even the backup. There are two nodes that come to Ebene, and soon a third node that will make Ebene… uh… there will be no downtime with respect to the internet because of how this was done. On the other hand, parking facilities is another story. I mean, unfortunately Ebene was built with a complete lack of planning with respect to parking, with respect to the roads. You can see illegal parking everywhere, people are parking their cars however they can. It is a real problem as we have no possibility of increasing the parking facilities while the building are cropping up like mushrooms and that is a

problem. But for transportation in general to get to Ebene, for the staff to arrive, it is okay. The second facility that is missing is in terms of food courts. We have a few places where we can go to eat but if you go there at noon, it is overly crowded. It is difficult to eat at noon even in the biggest food courts here or elsewhere. So, these are the things that affect us on a daily basis, parking and food but we have all the facilities needed for other things.

R01: From what I understand, you have very strict in-house policies, compared to other businesses, for example for health and safety, etc. Do you find it easy to implement all those policies?
RP09: Let me talk about those two aspects. Today, the policies and procedures for the policies are here to give us some guidance and not to lead the company. When we have a company with 2400-2500 people, it is extremely difficult to manage without strict and rigorous in-house policies. To come back to health and safety, it directly concerns the employees. So we cannot allow ourselves to be approximate. So we aligned ourselves to the Mauritian laws, setup under OSHA, so that whatever has to be done internally is done, respected. We have a small team, consisting of three people, but we have a whole structure behind this, everything from health and safety officers, first-aiders, training, fire wardens, etc. So this security aspect is one of the focus, one of the pillars, I could say in terms of focus in this specific cluster. We also have regular audits, local ones, external ones. There are external auditors who come to check the health and safety aspect, but also the security side. Annual audits of ISO27K. Every year an auditor will come to Mauritius to see if the standards are being respected.

R01: But, the procurement of the services that you have, is that your responsibility?

RP09: No. I do not manage procurement, I am just a user. Procurement at **X01**, once I have requested what I need, procurement commits to find, for example, three suppliers, based on our policies, etc. Once the suppliers are found…

R01: Do you manage service agreement?

RP09: I do service agreements, well not the contractual aspect, more like the user aspect, SLAs, the review of the vendor.

R01: The requirements are drawn up by you?

RP09: I draw up the requirements as I am the user, I may need this, this and this. We draft this in a contract, in a framework, there is an SLA, and then the contract is signed.

R01: And you have a company that manages the whole security aspect?

RP09: Exactly. Today we are working with a security company, with twenty or so people who work in our premises. So they are trained as security guards but also trained internally with regards to our policies. Our internal environment is quite particular so we have to explain what we expect of them. So this is done, and refreshed every month. When there is a new recruit for security, he is trained and has to have diplomas, etc. We cannot be approximate.

R01: But, do you need a specific platform, in terms of software, in order to manage all your workplace functions?

RP09: Not really. At the same time, today we have a tool, a CRM that is a Customer Relationship Management tool but it is more of a ticketing tool. So when the staff, 2400-2500 people, has to come to us, it is quite difficult if it is done over the phone or in the corridors…

R01: You need to have a follow-up…

RP09: We need a follow-up, there needs to be a ticket issued with a tool... In other companies there are others tools. So we get a ticket, with a reference number, a tracking, with an SLA attached to each request and once the ticket is closed there is a feedback to the person who issued the request. It is quite well structured.

Internally we have a qualitative aspect, there are surveys and reviews of our services to see what could be improved. So, I am at the front lines and I get feed-backs when people are happy or not, when they expect better from us, etc. We can use this to improve our services.

R01: To get back to the core of my research, how many years of experience do you have in the field of FM or workplace?

RP09: 10 years more or less.

R01: In your duties, before coming to **X01**, did you manage a sole building? How did it work?

RP09: Yes.

R01: One building. And now, your duties extend over a few buildings. Do you find that to be a challenge? How do you manage?

RP09: So, when I was at **X08**, there was one building over four floors. With 400-500 people at most. Moving to a company with 2400-2500 employees was a challenge that I wanted to undertake. I wanted this challenge because I thought that it was time to do something like this. A multi-building concept never crossed my mind because for me, once it is clear in my mind, with what I have to do and what the standards are and the staff I need, the rest is just monitoring. Well, it is true that when we talk about four different buildings, they are not identical, they do not have the same age…

R01: They have the same owner?

RP09: The two buildings of **B01** the same owner. **B02** has another owner and **B05** has another one, the former owned by a pension fund and the latter owned by the government. So three different owners, three different mentalities, etc. And that is the biggest challenge. When someone working at **B01** goes to **B02**, the first

comment will be “I saw that at **B02**, they have this facility… Why do we not have that?”. They do not understand the context. For them, we were supposed to have three or four uniform and identical buildings. The same for the service. But different people work at those buildings and so the human approach is different, etc. That is more of a problem than the volume.

R01: Do you only apply the same principles everywhere? The same policies? And is that done automatically? And you adapt to the building and the client?

RP09: For us, there is a demand and we know what we have to deliver and we work towards that. Some demands can be quite far-fetched which is normal as they expect more from us or they have a higher quality of demand. So we have to see what to propose, how to talk to them, be able to tell them what can and cannot be done, etc. But that is also management.

R01: Basically, what do you think is lacking at Ebene Cybercity?

RP09: I have to come back to the parking problems. Ebene is quite small. From one side to the other, it is a twenty minute walk. If they had thought a bit further into the future, they could have made Ebene, the whole Ebene region airtight; pedestrianised, with outlying parking space. Then get from the parking lot to work on foot or on a bicycle. But today, unfortunately, in Mauritius we are so materialistic that we have to come to work in our big cars to show off. While in Paris or in Brussels or in any European country where the pedestrian aspect is put forward…

R01: Where there is no pride associated with your motor vehicle…

RP09: Exactly. Your boss comes to work by train, etc. They had a vision but they did not go to the end their ideas. The second thing missing at Ebene is planning for the masses. All the land you see around you belongs to **X01**, to the government. All these plots of land are on lease. The government should have realised that in the future there would be so many buildings. And with buildings,

that there would be so many people here. There are from 18000-20000 here. They should have thought of other infrastructure. People spend up to 12 hours here do not have enough sports facilities. We have one in this buildings, 3 or 4 more. Maybe enough for 2000 people, not for 20000. They did not see the future with a global vision. They thought that it would never grow to such an extent. Then, surprise, there are 20000 people. They thought on a micro-level, saying, you have a small plot of land, do whatever you can with it. They should have had that concept of a smart-city.

R01: That went beyond them.

RP09: Exactly.

R01: The different building that you "possess", or where **X01** operates, are they all within walking distance?

RP09: Yes. Between the first two towers, there is less than 25 metres. The third tower is within less than 3 metres. **B02** is 200 metres from here. Generally, I walk from building to building during the day when the weather is fine, otherwise I take my car. Between **B05** and **B02** there are 200 metres. You are 10 minutes from every building. Which is convenient because if I had to go from here to the university and then find a parking space, the meeting would be already over.

R01: Do you think that there would be some kind of opposition if it was decided that Ebene would become a pedestrian zone?

RP09: I don't think that there would be any opposition. It would not be easy, because people are accustomed to their usual ways, but if tomorrow the governement decides… I always thought about that, near Paladium where there still are empty plots, around Verdun, imagine if these sugarcane fields were converted to parking lots. There would be thousands and thousands of parking spaces. From there to here, there could be shuttles. Just as in Port-Louis, from Caudan to inner Port-Louis, there are free shuttles that depart every 15 minutes.

R01: I just learned that there was a shuttle system in Ebene.

RP09: Here? It goes from Ebene to Bagatelle via **X07**. It was setup because of Bagatelle. The buses are red and they go back and forth from Ebene to Bagatelle. If you know the buses' time-table, you can go to lunch at Bagatelle and come back with the shuttle. It's something that could be popularised and harmonised for the masses. For me, it's a potential business which could be subsidised by the government.

R01: Generally, do you find Ebene to be a success?

RP09: I'll have to say yes. Despite all these little problems, compared to other places, it is a success. Mauritius does not have big spots apart from Port-Louis and Ebene, business-wise. There are no other towns. For a sector like the "City", which a relatively young one, Ebene has helped tremendously for this sector to get this massive today.

R01: Indeed, you have wanted to follow the trend, to come here with the ICT movement, and you have… If I understand correctly, X01, you have BPO side and a service provider side, which have two distinct roles?

RP09: They are indeed separate and distinct functions. To sum up, what is done in these two buildings, is IT solutions. So generally speaking, it concerns software conception for big companies. Those big companies that put their trust in us, and we work to automate their numbers, that is manipulating their numbers to save time for us, using software that you could not even imagine, that are world class and done in Mauritius by Mauritians. Who are mind-blowingly good.

R01: But those people remain in the shadows?

RP09: It is contractual work and everything is confidential. I cannot even tell you which companies we work for because it is so confidential. On the other side, there

is accounting part. Big companies, large enterprises, that do their accounting work in Mauritius with different levels of confidentiality. These two things are very distinct. On the one hand, there is pure IT solutions and on the other hand there is pure accounting.

R01: There is this vibe in Ebene, from my own research that I have done so far, I have found that there are three main things at Ebene. IT, accounting and education hub. Do you think that this makes for a good mix, a good vide to the Ebene environment?

RP09: Well if they chose those three aspects, it's because they are the easiest aspects to setup. Today, there are tens of different functions for BPOs. In Ebene, there could be twenty unique functions of BPOs. From medical devices made in Mauritius, then exported, to video conception, to pure IT. Even in IT there are five to six branches. The developer, automation, etc. The same is true for accounting. Some companies will do only cash recovery, auditing, etc. The three that stand out, the four I should say, audio-visual being the fourth one, everything from video manipulation to web design. Those four which are present at Ebene…

R01: Do you think that there is some form of status attached to having an address at Ebene?

RP09: Not really, because three quarters of companies at Ebene are foreign companies, that is companies outsourcing to Mauritius, they don't even know of Ebene. On the other hand, for the young people working there maybe that is the case. But if you remove yourself from the local workforce, that notion is status is lost.

R01: I have not yet met with the local companies, and maybe their answers will be different, but you are telling me that as a big international company, the answer is no, isn't it?

RP09: Maybe I'm in a different mindset. But for **X01**, Mauritius is just Mauritius. They could have been in South Africa or India. There is no added value with regards to the location in the country. However, with regards to the faculties, the work ethic, I would say that the Mauritian workforce, on everything bilingual, we speak French as well as English which is not something found elsewhere. For example, India is really good in BPO but they only speak English. Elsewhere they only speak french. Mauritius has the chance of speaking both. At **X01**, we have a language academy where 6 languages are introduced. Russian, latin languages principally…

R01: And that falls under your responsibility?

RP09: No, they are doing that for BPO. We have a hundred people speaking italian, german, spanish, etc. Those people are working in order to provide a service to the countries where those languages are spoken.

R01: Personally, do you find that working at Ebene is better than anywhere else?

RP09: For me it's an upside since I live in Quatre-Bornes, so it's a 10 minute commute. Having worked in Port-Louis, I find it to be a big upside to work at Ebene because getting stuck in traffic for one hour to get to Port-Louis, I prefer the 10 minutes it takes me to get here. What is also interesting are all the roads that converge here. There are 3 or 4 more ways of getting to Ebene. So this is also an upside. Elsewhere there is only one way. We can arrive from Rose-Hill, from Quatre-Bornes, from the Saint-Jean axis, from the motorway.

R01: But that means that people can get stuck for 30 minutes in traffic jams.

RP09: Indeed. The day of the floods, people were stuck for two hours in traffic jams and that was not simple.

R01: Thank you etc. I'm impressed by… You are the only one of five companies that has a formal facilities management at the workplace and I have not seen that so far.

RP09: It is a long-established thing at **X01**. Facilities is only done in companies like **X08**, **X05** and then **X01** and a few smaller companies.

R01: Could **X01** have outsourced its facilities management service?

RP09: Indeed. That could have been done.

R01: There would have been no confidentiality problem?

RP09: Not at all. It depends on what you share with the vendor. Today, you just have to know what you want from a vendor, everything can be classified. And you only give out the necessary information.

R01: Alright thank you very much…You have given me a lot of information…If you don't mind, I will ask you to sign the information sheet. This is your copy and this one…this one…if you sign it here…and with your name …I will keep this as my copy…

RP09: I keep this one?

[Signing of information sheet and consent form]

R01: Yes, yes…Thank you

RP09: I will walk you out…

[End of Interview]

Appendix G: Updated Master Plan of Ebene Cybercity as at Nov 2015

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