

**REDESIGN OF CORE BUSINESS PROCESSES OF THE NATIONAL BUILDING  
REGULATIONS OF SOUTH AFRICA**

**by**

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**26 August 2016**

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**Signed**

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**Date**

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## **ABSTRACT**

This paper describes the redesigning processes of the National Building Regulations of South Africa. These processes are administered by the National Regulator for Compulsory Specifications (NRCS) in terms of the National Building Regulations and Building Standards Act 103 of 1977 (The Act). The application of the business processes and the Building Control Officers from various local authorities nation-wide who enforce the National Building Regulations and Building Standards Act, 103 of 1977 (hereinafter referred to as “the Act”) with particular reference to implementation of core regulatory business processes within the building industry in Southern Africa. The investigation was largely motivated by the high number of injuries, deaths and/or human lives affected adversely and reported due to collapsing and defective buildings.

These disasters occurred at various Local Authorities, in private residential homes, government-owned buildings, abandoned and commercial buildings, such as shopping malls, have been investigated and reported by the Building Regulator, i.e. the NRCS in collaboration with the Department of Labour’s Commission of Enquiry between the years 2012 and 2014. The reports show that in those sectors of building, the local authorities’ Building Control Officers, as the legislated enforcers of the Building Regulations (with the oversight role played by the NRCS), experienced the highest levels of non-compliance by various parties who are affected by the Building Regulations, i.e. building owners or their legal representatives, built-environment professional practitioners and builders.

This study applies the interpretive approach underpinned by qualitative methodology where interviews were used to collect data from building owners, prospective building owners, building occupants, built-environment practitioners, Local Authorities’ building control officers and The Regulator of the National Building Regulations. The empirical findings revealed that there is a critical need for business process review and strategy shifts that advance objectivity and benefits to compliance, visibility and awareness of regulatory process, the highlights of possible endangerment of human life due to non-compliance, the outlining of sanctions for failure to comply, and stakeholder liaison. The output is a re-module of business processes that will enforce and maintain compliance of the building regulations of South Africa.

**Keywords:**

National Building Regulations & Building Standards Act 103 of 1977, Building Regulations, National Regulator for Compulsory Specifications (NRCS), National Building Regulations Business Unit, Building Control Officers, Local Authorities, End-Users.

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## CHAPTER 1: INTRODUCTION

### 1.1 Introduction

The building industry in South Africa is regulated by means of the National Building Regulations and Building Standards Act, 103 of 1977 (hereinafter referred to as "the Act"). According to Watermeyer and Milford (2004), in their study of the use of performance-based building codes to attain sustainable housing objectives, non-adherence to the Building Regulations has resulted in numerous complaints and disasters identified as follows:

- The increasing of informal structures and settlements;
- Construction of Reconstruction and Development (RDP) houses without submission and approval for building plans by Local Authorities' Building Control Officers consequently resulting in poor quality building structures;
- Poor reticulation and infrastructure;
- Collapsing of buildings, e.g. Tongaat Mall in Durban, which collapsed in November 2013 killing one person and injuring twenty three others; and
- Non-adherence to energy-efficient buildings, contributing adversely to climate change.

Further to their study, Watermeyer and Milford (2004) emphasize that the risks and structural failures expose citizens to hazards as a result of non-compliance that arises from various types of dilapidated buildings, ranging from residential, commercial, to government-owned buildings country-wide. The risks are further due to lack of consideration for buildings to provide facilities for people with disabilities and special needs. Some of these related risks are overlooked due to deliberate non-compliance and/or lack of exposure of the implementation of the Building Regulations and its benefits to the broader public.

### 1.2 Research Rationale

#### 1.2.1 *Background*

The National Regulator for Compulsory Specifications (NRCS) was established in terms of the National Regulator for Compulsory Specifications Act, 5 of 2008 (hereinafter referred to as the "NRCS Act"). NRCS is responsible for technical regulations of various industries, including the built-environment profession. This profession, in South Africa, is regulated by means of the Act. The Building Regulator is challenged to effectively implement its legislative mandate, as well as to develop and implement regulatory processes and procedures.



Therefore, the purpose of this paper is to analyse, theoretically and practically, the effectively National Building Regulations' business processes for objectivity to the National Building Regulations & Building Standards Act 103 Of 1977 of ensuring that buildings are safe, healthy, environmentally friendly with sound quality and suitable for human occupancy with the intention of developing a framework that will guide the implementation of the Regulator's mandate.

It is argued by the affected stakeholders that this framework would be driven by a new business process redesign with the intention to close the preliminary gaps identified at the initial analysis stage. The initial analysis was guided by a study by Laubscher, J. (2011), in the Building Control Officers' Convention resulting in the following questions:

- Is the current legislation still relevant to the changes occurring in the built-environment industry?
- Is the promulgated legislation implementable? The latter is confirmed by the Regulator's Business Unit, known as the National Building Regulations Business Unit, responsible for the oversight role of ensuring compliance to the legislative mandate and its operational mechanisms. This Unit's processes and procedures focus on its four key activities, namely:
  - (i) Ensuring uniform understanding and implementation of the Act by all stakeholders affected by it, i.e. building owners and/ or occupants, built environment professionals, Building Control Officers and inspectors, and various built environment regulators.
  - (ii) Administer the National Building Regulations Review Board: The Board is established in terms of Building Regulations to serve as an appeal board to review the decision of the Local Authority's Building Control Officer where building drawings have been rejected. An applicant makes an appeal application to the Review Board through the Building Regulator's Business Unit for the matter to be resolved in the Review Board's Tribunal.
  - (iii) Conduct verification of Building Control Officer's qualifications, ascertaining the expertise of building plans approvals for safety of buildings.
  - (iv) Conduct Building investigations as and when required for random verification of the level of compliance by all affected stakeholders.

According to analysis by Laubscher, J. (2011), it is evident that since the establishment of the Regulator in 2008, there has been no evidence of action taken against any party who

contravenes the Act. Hence the question is asked as to whether the legislation is implementable if its output cannot be measured.

*Are there regulatory processes in place which can be verified against implementation?*

Arguably, since the establishment of the NRCS in September 2008 and its National Building Regulations Division, the strategy of the organisation has not been effective at outlining, delivering, and demonstrating the value of Building Regulator's applicable management or business processes. The Department of Trade and Industry, as the custodian of the legislative mandate, has relied upon the transitional agreement which allows the NRCS to take-over from the South African Bureau of Standards (SABS) in administering the Act. In effecting this agreement, it still leaves the NRCS with the challenge of implementing obsolete processes, which in turn, affect its effectiveness and efficiency as an organisation.

### **1.2.2 Problem Statement**

There is lack of effective and efficient building regulation processes and procedures in ensuring the safety of buildings by the National Building Regulator as mandated by the Act. The Act plays a critical role in building processes, and failure by those processes result in many South Africans occupying unsafe and unhealthy buildings. A perspective held by Windapo and Rotimi (2012: 2, 283 – 299), when examining the contemporary issues in the collapse of buildings and their implications for sustainable developments, is that where there were failures in building processes, the end resulted in collapsing of buildings. They (op. cit.) further acknowledged that building processes failures not only resulted in collapsing of buildings as a problem but also had an adverse impact on the economic sustainability of the built-environment industry; thus the problem identified was the ineffective implementation of the legislations' business processes.

Further to perspective by Windapo and Rotimi (2012: 2, 283 – 299), lack in effective and efficient building regulation processes and procedures is as a result of many years of traditional and informal application of regulation, where regulations are only prescriptive on certain aspects of building processes and not on others. If this is not addressed, South Africa will continue to witness buildings collapse. Furthermore, according to Windapo and Rotimi (2012: 2, 283 – 299), there is less understanding of why and how buildings do collapse. This results

in the lack of safety of building for both construction and occupation, thereby not achieving the “habitat for humanity” principle that is advocated by the Regulations based on the perspective by Windapo and Rotimi (2012: 2, 283 – 299).

This research intends, therefore, to investigate the causes and recommend an approach to the Building Regulations’ business process innovation to assist in resolving the stated research problem.

Furthermore, in alignment to Windapo and Rotimi (2012: 2, 283 – 299), the National Building Regulations have displayed inadequate business processes modeled with notations that are not aligned to the Act. The current business processes were established for implementation in the year 2002 by the erstwhile SABS’ Regulatory Division. The latter does not outline any stakeholder liaison processes with the end-users, built environment practitioners, Building Control Officers and inspectors, and various regulators or stakeholders affected by the legislation. This renders such business processes obsolete since it does not effectively support the provisions of “the Act” and its 2008’s revision.

Preliminary investigation by Watermeyer and Milford(2004), has outlined that National Building Regulations have been issued to regulate administrative procedures as well as to ensure functional requirements are met, thus substantiating on a need to develop a framework that makes use of business process concepts to effectively implement the provisions of the Act. Watermeyer and Milford (2004) further recommended that the Act be amended to empower the Minister of Trade and Industry to issue revised regulations to improve the efficiency and effectiveness within the built environment. The latter is supported by various incident investigations reported with regards to collapsed buildings around the country. Tongaat Mall in Durban South, as one of the cases, has recently been reported to have collapsed in November 2013 and killing one person on site with twenty three injured. This incident resulted in an on-going enquiry where one regulatory and compliance body, such as the NRCS, Local Authorities’ building Control Officer and inspectors, and the Department of Labour shifts the blame to another stakeholder without evidence on the (in-)effectiveness of the processes. An indication of failure of National Building Regulations systems is displayed on various investigative enquiries on cases of buildings collapsing globally as follows:

- (a) “Tongaat Mall foreman pleads ignorance - July 24 2014 at 02:27pm By N. BARBEAU”.
- (b) ‘Egypt building collapse kills 17 people: Security official Jan. 2013 - Times of India”.

- (c) “Egypt apartment building collapse kills 23 -Saudi Gazette Jan. 2013”.
- (d) “Bangladesh building collapse toll hits 500 - Sydney Morning Herald 2 May 2013”.
- (e) “Brazil building collapses traps 15 – Las Vegas Sun 8/31/2013”.
- (f) “CAPE TOWN - The Cape Town Fire and Rescue Service reported that there have been no reports of any fatalities after a section of a building collapsed in the CBD. Steps leading to a parking area at an internet cafe collapsed in Bree Street this morning. It is believed there was nobody in the building at the time”.

Given the above cases, there is strong evidence to suggest that the inadequate and obsolete business processes of the National Building Regulations are a contributing factor to the built environment’s failures and inefficiencies. It is against this problem statement that the study aims to address the problems identified by means of research questions below.

### **1.3 Research Objectives**

Given the research problem, the main objective is to **analyse, theoretically and practically the effectiveness of the National Building Regulations’ business processes for objectivity to the National Building Regulations & Building Standards Act 103 Of 1977 of ensuring that buildings are safe, healthy, environmentally friendly with sound quality and suitable for human occupancy.**

### **1.4 Research questions**

Drawing from the research objectives, the research intends to address the following questions:

- How do business processes assist in implementing the provisions of the Act in order to ensure that buildings are safe and habitable for humans?
- In terms of the Act, how do different management processes enable the Regulator to deliver on its mandate?

In view of the above questions, the research focused on the review of the provisions of the Act. Further, the procedures applied by the municipalities and the building contractors that led to the collapse of certain buildings are reviewed. The reviews have laid a solid foundation for the re-engineering of the processes that are aligned to the provisions of the Act.

### **1.5 Significance of the study**

The study fills the gap in that it has confirmed and acknowledged, through a study by Windapo and Rotimi (loc. cit.), the adverse impact that the lack of implementation of efficient and

effective processes of the Building Regulations had on building structures, its infrastructure and to the occupants of various types of buildings, as well as the economic impact. The identified gap will be filled by considering re-engineering of the business processes and re-defining the roles and responsibilities of role players affected by the legislation as referred to in this study. The study in support of the views by Windapo and Rotimi (loc. cit.) is of further significance as it seeks to address if there are legislative challenges from the perspective of implementation as follows:

- definition of the process mapping and modelling;
- Regulatory framework Verification of processes.

The above process assists in defining the mission of the Building Regulators in South Africa to protect consumers and citizens from unsafe and unhealthy buildings and meeting Government's imperatives with positive economic impact. The study will provide guidance to business re-engineering processes, in alignment with the National Building Regulations and the Act as a regulatory process with its object emanating from the legislation. All four levels of stakeholders, as listed below, will benefit from the study respectively as follows:

(a) Oversight Regulators – Re-engineered business process to fill gaps that existed in the building processes, in that:

- There will be introduction of compulsory compliance, approval, inspections and sanctioning sub-processes which are aimed at curbing non-conformances to the object of the Act, thus empowering the Built-environment Regulators, ensuring sound and good quality building by the practitioners as well as the protection of ordinary citizens against unsafe buildings.
- Stakeholder awareness and liaison sub-processes will be in place where all stakeholders will be informed of all compliance requirements, impact and benefits thereof in support of voluntary compliance.
- A Pro-active Risk Based Approach will be introduced where the focus will be on high risk areas within the built-environment industry to protect citizens, industry, economic losses and to have an innovative and sound building industry.

- (b) Enforcement Regulators – Building Control Officer to gain recognition in industry policies and be empowered to impose penalties for unlawful activities within the built-environment industry.
- (c) Built Environment Practitioners – To guarantee quality buildings with the view of a well regulated, competent and innovative industry with economic growth factors.
- (d) Prospective building owners and building owners, occupants and citizens at large – To gain healthy, safe, energy efficient, environmentally friendly and habitable buildings accommodative of citizens with special needs, for example paraplegics.

### **1.6 Limitations of the research**

The weaknesses of the research relate to the following:

- Data collection from various levels of stakeholders of which some levels of stakeholders were considered to be subject experts and some, non-subject experts.
- Data collection was limiting in that information was gathered from both knowledgeable and uninformed stakeholders who misdirected the objective of the study for personal interest and may have resulted in the ambiguity of the results of the outcome.
- The processes were identified as per the study and the information gathered may require further verification of data for confirmation of facts separated from perceptions.

### **1.7 Rest of the thesis**

Given the above, this study is structured as follows:

**Chapter 2:** Literature review: Provides insight into similar or relevant work done to explain, describe or explore the challenges of implementing the provisions of legislation, business processes and re-engineering business processes;

**Chapter 3:** Research design and methodology: Forms the basis of the research philosophy and strategy which led to the design and collection of data and the analysis thereof to address the objectives of the research. The Chapter further discusses the field work and ethical issues considered.

**Chapter 4:** The findings and interpretation: Discusses how the data collected was analysed and interpreted in line with the literature and the conceptual framework.

**Chapter 5:** Conclusion: Devoted to a conclusion, discussing how the objectives of the research were met, highlighting the contributions to the body of knowledge, further research and limitations to this research.

### **1.8 Summary**

This introduction has outlined the background together with all the core aspects of this research study, providing an overview of the research report that follows. The next chapter discusses some of the relevant and existing literature that assists in understanding and interpreting the problem and the gaps in the literature which the research has attempted to address.

## CHAPTER 2: LITERATURE REVIEW

### 2.1 Introduction

In the previous chapter, the research background, rationale, and objectives were discussed to provide context and understanding of the research topic and the need to investigate and determine factors influencing the implementation of the mandate of the Regulator, as prescribed by the Act. Chapter 1 further introduced the problem statement and how it provides context to the research.

In view of the above, literature review was undertaken that aimed at obtaining an overview of prior studies related to the current topic, but with gaps, which this study tried to address to bring about effective implementation of the mandate of the Building Regulator set out in the Act. It must be noted that there has not been sufficient work undertaken in this area and, as such, little scientific literature exists. The literature reviewed, thus far, covered the following aspects:

- The origins of South African Building Regulations between 1650 and 1740;
- Reform driven by Legislation;
- Reasons why buildings collapse and culture in business process management
- Process re-engineering and legislation;
  - ✓ Contemporary issues on the Business Information System;
  - ✓ Online Regulations and implications;
  - ✓ Information System's Modeling process and legislation;
  - ✓ Business process management: a boundary-less approach to modern competitiveness;
  - ✓ Improving Product Development Process Design;
  - ✓ Enterprise Resource Planning (ERP) Design and Implementation;
  - ✓ Business model dynamics and innovation: (Re) establishing the missing linkages;
  - ✓ The effects of culture and structure on strategic flexibility during business model innovation;
- Core elements of Business Process Management;
- Process Innovation: Re-engineering work through information technology;
- Business re-modeling for sustainable innovation.



This section of the dissertation approaches the lack of uniformity in understanding, interpretation and implementation of the Building Regulations, and other related regulations, versus the level of non-compliance leading to efficiency debate in terms of incidences leading to injury or death of humans due to defective, unsafe and unhealthy buildings, which do not meet the environments requirements and are not suitable for human occupancy.

## **2.2 The origins of Southern Africa's Building Regulations**

Laubscher (2011) in his study of the origins of the Building Regulations in Southern Africa pointed out that the built environment had been informally regulated from the ancient times where Egyptians used the familiar grid pattern to house workers on the pyramids. He acknowledged the ancient motion as an indication of the importance of safely housing people and their possessions, which is referred to in the current Building Regulations as “habitat for humanity”.

Furthermore, Laubscher outlined that, due to additional health requirements being prescriptive on certain aspects of buildings such as sewerage removal and the aqua-ducts constructed for the provision of fresh water, and all other building and infrastructure related activities, catastrophic events had proven to occur. He also explained that those requirements exerted influence on the natural habitat being regulated by man in terms of the originations of the Building Regulations. This is supported by the objectives of the study in that it emphasizes the importance of regulating the built-environment and structures for human habitation.

The details outlined so far may lead to some deductions that the Author acknowledges the establishment and the objective of the legislation. Of concern, however, is that the Author did not outline the business processes of implementation of the Building Regulations and its success and/ or failure rate.

Similar perspective is held by Watermeyer (2010:6), having referenced the “building regulations in brief” (Tricker and Algar, 2009), provided the most concise description of a building regulation as a statutory instrument that sets out the minimum requirements and performance standards for the design, as well as the construction of and extension to, buildings. Watermeyer had laid a basic structure of building regulation's objective and, similarly to Laubscher (2011), failed to map out how the regulatory objective of ensuring quality habitat for humanity can be achieved, and the impact it would have in the built-environment and building industry.

Taking the discussion further, Laubscher (2011) and Davies & Jokiniemi (2008: 52-53), in agreement with Watermeyer's (2013) discussion, stated that there was no differentiation between building codes and building regulations. He acknowledged that the codes and regulations defined them overall as a statutory code which regulated the construction, alteration, maintenance, repair, and demolition of buildings and structures. The latter still outlined the importance of regulatory processes and the provisions thereof, even if they could have been defined semantically; the object remained unchanged. Given Laubscher's argument, defining the statutory code and its applicability, Watermeyer (2010: 6) also did not distinguish between the two terms and instead defined the stakeholder role, applicability of building codes and its impact on socio-political factors and community considerations, such as:

- The establishment and expansion of informal settlements;
- Health hazards of unregulated structures;
- Collapsing of buildings; and/or
- Structural defects.

The basic structure set by Watermeyer and Milford (2012) pointed out that the National Building Regulations had been promulgated to ensure that administrative procedures as well as functional requirements of the legislature are met. They substantiated a need for the development of a framework that would make use of business process concepts to effectively implement the provisions of the Act. Watermeyer and Milford (2012) further recommended that the Act be amended to empower the Minister of Trade and Industry to issue revised regulations to improve the efficiency and effectiveness within the built environment.

In support of Watermeyer and Milford's perspective with regards to the establishment and implementation of effective administrative and functional processes, a reference is made to various incident investigations reported with regards to buildings that had collapsed around Southern Africa, with Tongaat Mall in Durban South as one of the recent cases reported in November 2013, where one person died on site and twenty three were injured.

### **2.3 Reform driven by Legislation**

The Object Management Group (2010), as an institution that developed the specifications for Business Motivation Model (BMM), have argued, in their specification for systems development process, that in order for an organisation to have an adequate, functional and well-managed

business system in an organised manner, the following motivation model factors would have to be custom-made and catered for:

- Purpose and motive for establishment of a system in an organisation and the output thereof;
- Identification and definition of the elements of the required system;
- Indication of how all the identified factors and elements inter-relate in provisioning for governance, i.e. development of policies and procedures;
- Motivation Model's design would have to be easily constructed as a basic logical tool for storing, cross-referencing and reporting the elements of system in support of processes that are driven by the need for reformation.

The Object Management Group's (ibid.) specification is acknowledged for its motivation model technique, that it can benefit the current study as it proved affirmative results in successful development of systems, system modeling and implementation of Information Technology (software) tools and repositories. This should bring a total turnaround or bring reformation based on legislation without the review of the entire legislation which is a time-consuming process; however the review should focus on every cornerstone that requires reformation as follows:

- The aspiration for reformation;
- Its action plans and how to realize them;
- Strategies for approaching goals;
- Tactics for achieving objectives;
- Influencers;
- Provision of opportunities to help the National Building Regulator to function or operate;
- Provision of threats to highlight what will thwart the systems operations;
- Outline the strengths from which the system can operate;
- Highlight the weaknesses that the system must be able to re-assess.

In support of the motivation model for the current study, it is critical to understand the system's perspective, motivation and its reaction to change in order to address reformation of the National Building Regulations as driven by the legislation. A similar perspective with a different approach is held by the Organisation for Economic Co-operative Development (OECD) – Reviews of Regulatory Reform – Italy (2010), who claimed that better quality regulations are strengthened and reformed by cutting a high number of similar and duplicated legislations, resulting in over-regulated industries without tangible output and impact. Furthermore, OECD

(2010) indicated that a drastic cut to a high number of laws and the establishment of a stakeholder engagement during the policy review process encouraged the self-regulatory approach, thus enhancing and reforming the regulations through reviews.

The study fully supports the perspective of OECD (2010) as a basic principle towards re-affirmation of the National Building Regulations' business processes. Application of review and reformation of processes, driven by the legislation's approach within the built-environment and building industry, will certainly bring about the delivery of required services to meet the object of the legislation and constructive accountability by the implementers and the enforcers of the legislation. Impact of the processes by the Regulators will also be measurable to determine the processes' efficiency.

#### **2.4 Why buildings collapse?**

Windapo and Rotimi (2012), in their study of examining contemporary issues in the collapse of buildings and their implications for sustainable developments, argue that the provision of safe buildings played a major role in the socio-economic aspects of human development. Although the study focused only on the built environment and building industry's stakeholders, they argued that the builders were primarily responsible for the collapsing of buildings by compromising on quality for quick profit gains and undermining the government's objective of economic sustainability.

Furthermore, Windapo and Rotimi (ibid.) added that with the government, being a major stakeholder in the building sphere, the overhauling of planning and implementation policies within the building regulatory environment was sought. The current study supports the overhauling of planning and implementation of policies; it looks at the effective implementation of revised policies without losing the objective to ensure the safety of buildings in terms of quality, while retaining the economic growth and sustainability of the built-environment and building industry.

#### **2.5 Process re-engineering and legislation**

There is little evidence from the stakeholders affected by the National Building Regulations of the effectiveness and efficiency of regulatory business processes and systems in place. The affected stakeholders usually survived on the belief that there are no major market failures and the impact highlighted, which may expose the inadequacies of implementation of the said

legislation. Atreya (2012), in his study of “Re-engineering of Nepal Rastra Bank”, identified Business Process Re-engineering (BPR) as one of the techniques universally accepted as remedies to all problems faced by organisations, including challenges of processes and systems inefficiencies, which is what the current study addresses. Furthermore, Atreya (ibid) presented the technique as a successful measure in bringing about radical changes, improved performance and can achieve results. He further highlighted that although the concept originated from the private sector, it is also essential and of equal importance to the public sector.

Thong (2014), on business process re-engineering in the public sector, supported the position of Atreya (2012). Thong (ibid) took the discussion further by suggesting that BPR is applicable where there are political and social pressures to re-engineer business processes. As such, it was highly approved for re-designing the processes for performance bench-marking by both private and public sectors. Atreya (ibid) further indicated that the use of BPR was nothing but a steady progress in the right direction, in that in order for a reform process to be accelerated; re-engineering should be a continuous process built-in organisational systems, processes and people. The latter statement clearly indicated that the technique is applicable to the current study.

Nepal Rastra Bank’s success provided clear direction on the required reformation, committed national leaders, transparency in information and support as well as commitment from all concerned who provided momentum to the re-engineering activities, which would be the recommendation for implementation in the current study of redesigning the National Building Regulations’ business processes.

The above perspectives are similarly supported by Marija and Kiril (2012). In their study on business process re-engineering, they acknowledged that although the BPR was a fairly young phenomenon, it could be used as an intervention to assist business leaders to decide on what is actually needed to be introduced in an organisation. It is therefore arguable that the work done by Atreya (2012), Thong (2014) and Marija and Kiril (2012) are relevant in teasing out the challenges surrounding the implementation of the provisions of the Act using BPR.

## **2.6 Contemporary issues on business information system**

Sommerville (2011) has laid a basic structure, pointing out that the system, including both hardware and software components, define operational processes; of concern, however, is that the Author focused on the system working within the parameters of, and limited to, the functions of the organisation. What is of essence, which was not indicated by Sommerville (2011), is that the system should serve the objectives of the organisation and meet the needs of the relevant stakeholders outside the organisation who are affected by the system or the functions of the organisation? Building regulations, as a current study, are a practical example where external local authorities, property owners and occupants, and built-environment practitioners are affected by the regulatory systems and processes, which may require to be reviewed to introduce a Customer Relationship Management System to integrate operations and services amongst all parties.

It is acknowledged from Sommerville's perspective that the system is influenced by organisational policies, procedures and structures, and the study supports that the procedures be based on approved structures and policies.

Sommerville (2011) furthermore stated that the systems redesign process allocated the requirements to either hardware or software systems, by establishing the overall system architecture with its design and development features such as:

- Requirements that were very dynamic through changes in markets, laws, legislations and technology;
- Systems must be integrated in other existing systems; and
- Systems have an influence on Human Resources.

In answer to the challenge that is being addressed in the current study, business processes are believed to be the starting point and the objective of Software Systems Development Process, which will encompass the review of any existing processes and systems. Of concern, however, is that Sommerville's statements did not elaborate, in detail, on the success and/ or failure rate in the implementation of the designed and developed systems, except that he considered the Business Information Systems as the support tool, used once the conceptualisation stage of addressing the problem is concluded; essentially, therefore, not addressing the problem that existed due to failure of efficient implementation of the processes and/ or systems from the onset.

## **2.7 Online regulations and implications**

According to Bouzidi (2012), regulations in various industries have become increasingly complex and involved more than one technical area covering products, components and projects implementations. In concurrence with the current study, Bouzidi (ibid) elaborated further that those regulations played an important role in ensuring quality of regulated industries. In acknowledgement of Bouzidi's work, concerns emerged when the object of the regulation was confused with the results of implementation of the regulations. The current study also contends that the Regulation's existence does not necessarily confirm the effectiveness of regulatory processes or implementation thereof.

In his conclusion, Bouzidi outlined the importance of an information technology application to interlink all affected stakeholders to the Regulator. This, according to Bouzidi, will provide simpler, better and faster access to the services of the Regulator and response by the Regulator. As much, as the study partially supports Bouzidi, the concern within the building industry and the built environment, with regards to information-technology based regulations, would be the socio-economic factors, in that not all stakeholders affected by the regulation have access to Information Technology applications' scheme. Where the regulatory system would be discriminatory in any form, it would be found to be violating and defeating the regulatory objectives.

## **2.8 Information Systems modeling process and legislation**

According to Madsen (2010), in her study of knowledge and information modeling, a system modeling is an abstraction and representation of features that are considered important and ignoring those that are considered unimportant for understanding of the underlying reality. She further emphasized that these models help to clarify the grasp of the modeled subject and helps to communicate the ideas to people.

Alde (2013) takes the discussion further, with similar views to that of Bellahsehne and Leonardo (2008), who both concurred that process modeling and notation emerged as a standard language for capturing processes, especially at the level of domain analysis and high level systems design. They advocated the application of modeling approach as a tool to be used at the early stage of responding to the challenges by consideration of the following Process Modeling and Notation's qualifying factors:

- a) Triggering event – in a case of current study, need for a National Building Regulatory system;

- b) Process modeling all important paths; and
- c) Sequencing of events from the initial activities to final stage.

In support of the latter studies, NRCS would have to conduct a systems analysis and consider the similar approach and factors by Alde (2013) and Bellahsehne and Leonardo (2008) as follows:

- a) Triggering event – the inadequacies and/ or failure to regulate the built-environment and building industry to ensure safety of building owners and occupants, and to deliver sound quality and habitable buildings that are healthy, safe and environmentally friendly to all citizens; such as in the case of the current study, the need for a National Building Regulatory system;
- b) Process modeling all the important paths – designing the process to meet the objective of the legislation, the process impact verification of efficiency and proficiency of the process. In this study, all stakeholders roles would have to be inculcated in a process and activities outlined in a process design; and
- c) Sequencing of events from the initial activities to the final stage – NRCS would be required to list all the activities entailed in regulations of buildings, prioritize the critical ones, omit the unimportant ones, and introduce value-adding for efficiency and proficiency of the would-be system.

A perspective similar to Madsen (2010), who claims that systems modeling is an abstraction and representation of features that are considered important and ignoring those considered unimportant for understanding of the underlying reality, is also held by Jeston and Nelis (2014), who hold a view that missing smaller yet critical details in management of a business process may lead to the defunct of the entire strategy of the organisation, as well as defeating the purpose of business management as a business process improvement tool with its key elements being:

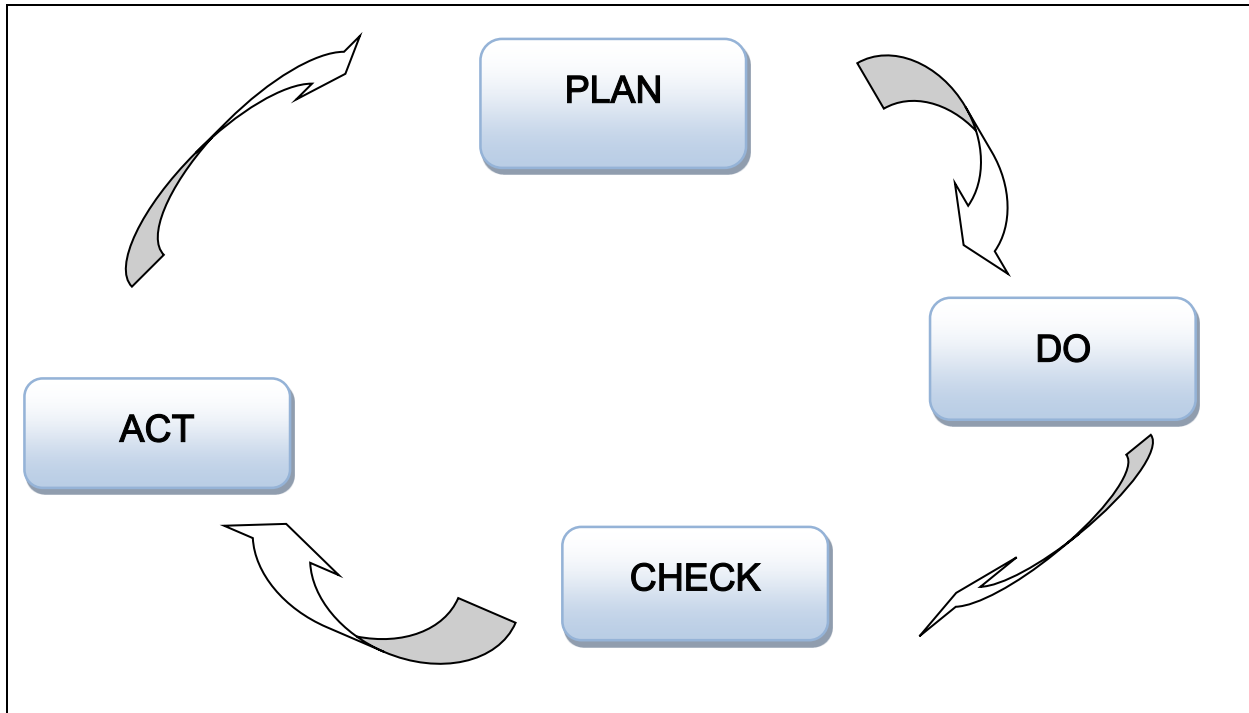
- a) Focus on achieving the organisational objectives;
- b) Focus on improvement;
- c) On-going performance review and management,
- d) Regularisation of essential business processes.

In their study, Jeston and Nelis (2014) interrogated the historical approach that most organisations apply for process improvement. They argue that most organisations apply the



'Deming Cycle" (Walton, 1986) of "Plan", "Do", "Check" and "Act", which is shown in Figure 1 below.

**Figure 1: Deming Cycle Model**

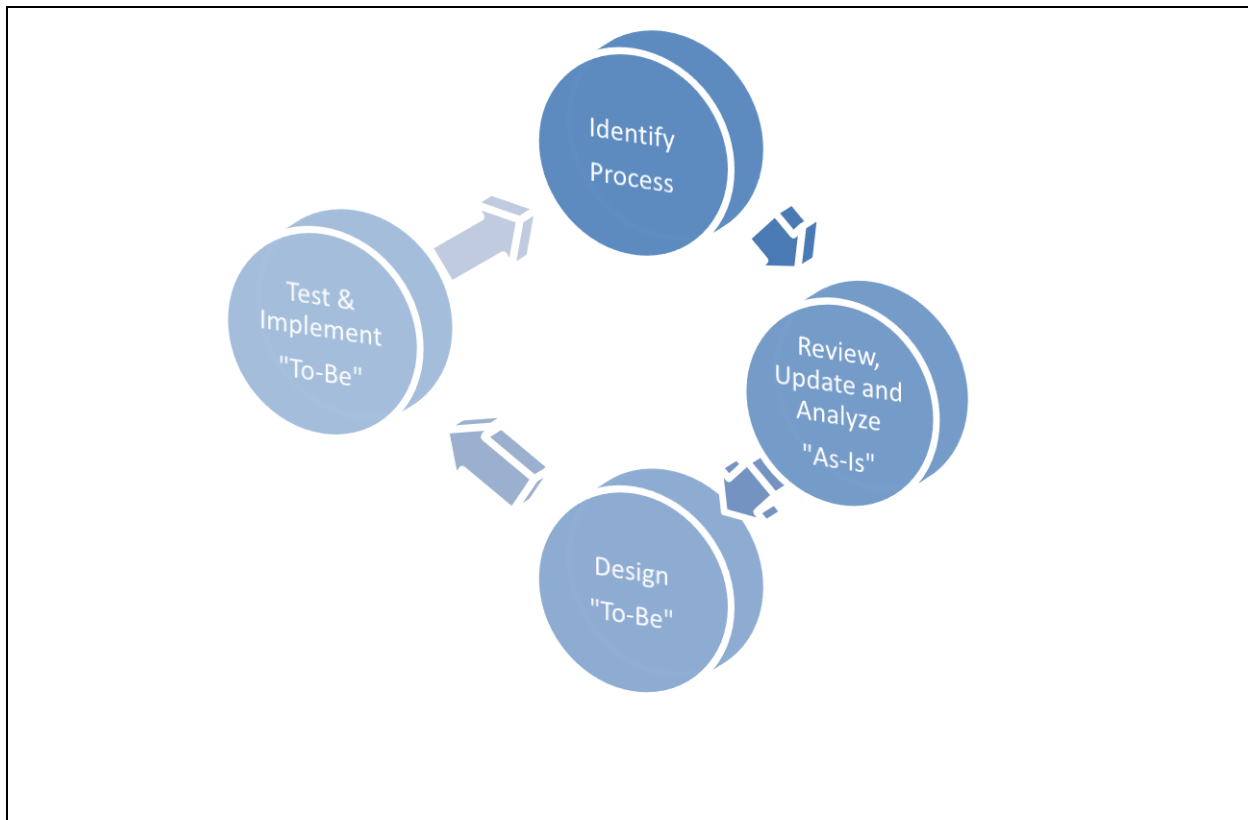


**Source: Deming Cycle" (Walton, 1986)**

The approach was identified with shortcomings and revised as a business improvement process to include the below listed stages of business process improvement to the Deming Cycle Model, resulting in the Business Process Management Cycle as shown in Figure 2 below:

- "AS IS" Deming Cycle Modeling process;
- Redesigning stage;
- "TO BE" process;
- Redesigned Process.

**Figure 2: Business Process Management Cycle**



**Source: Deming Cycle Model Process” (Walton, 1986)**

With the business process management vouching for improved business processes, the current study's problem statement is being addressed and it is confirmed that the NRCS had its shortcomings, in failing to pay attention to smaller details by applying the Deming Cycle model approach on its building, and other related and relevant regulations business processes, without further reviewing it as per the defined key elements of the Business Process Management. It is argued that review of business processes, as a significant contributor for any organisation, achieve its organisational objectives; NRCS is faced by a similar situation where, in order for it to address the outlined problem statement, it will be required to consider the Business Process Management as one of its possible solutions to the existing problem.

### **2.9 Enterprise Resource Planning (ERP) Design and Implementation**

Helo and Addo-Tenkorang (2011) in their study, affirm that the Enterprise Resource Planning System is another method that enables an organisation to integrate all its primary business processes in order to enhance efficiency and maintain a competitive position. They further qualify their literature by stating that the success of the system is dependent on successful

implementation of system. They emphasize that the enterprise-wide system is designed to integrate and optimize the business process.

This latter study is complimentary to that of Jeston and Nelis (2011), in terms of the application of Business Processes Management for clear definition of the organisational direction, based on the review and re-engineering processing for continuous business improvement.

The argument, however, is that the current study has failed to identify the need for the enterprise-wide information system, and to develop a plan for its implementation. The stakeholders in this study prove to have been excluded in the ERP process planning, as an industry driven concept and system that is generally considered as a practical solution to achieve a vital organisational strategy.

The study advocating the use of ERP Systems is supportive of the current study where the information-based system, as a tool, is to be applied in the regulatory processes of the built-environment, in terms of the building and other relevant and related regulations, as well as building standards.

### **2.10 Product development process design and improvement**

A view held by Unger and Eppinger (2011) is to express the improvement of product development process design as a method for managing information flows, risks and iterations. This view is found to be broader contextually as compared to all other literatures reviewed in this study. Most of the literature reviewed focuses on the processes themselves, the design thereof, planning, as well as implementation. However, Unger and Eppinger (ibid) focus on the process design and the factors influencing the improvement of the developed product process design.

### **2.11 Process modelling and mapping**

A study by Thompson (2011) points out that the most powerful weapons in the processes and systems management is process mapping. He takes the discussion further by suggesting that professionals are tasked with creating useful and efficient tools for organisations, often finding themselves collaborating with customers, stakeholders and/ or end-users who do not understand the business processes, much less upstream and downstream processes. He then acknowledges that a process map may go a long way to building the understanding of

downstream and upstream processes while highlighting problems, miscommunications, gaps, redundancies, workarounds, rework loops and waste. It is in support of the study, in summary, that process maps define the following in every business:

- What must be done.
- How it should be done.
- Where it should be done.
- And importantly, why it must be done.

It is thus against this background that the problem statement, as outlined in this study, is being confirmed to have lacked to address all the factors that built an effective and implementable regulatory business process.

## **2.12 Culture in Business Process Management**

In a similar perspective to that of Madsen (2010) and Jeston and Nelis (2014), Vom Brockle and Sinnl (2011) describe the Business Process Management as a management approach that is developed with a strong focus on the adoption of Information Technology, with a growing awareness in a holistic organisational perspective as a cultural practice. Of concern, however, is the view by both the Authors, sighting that culture of BPM is under-researched and that areas for future research are revealed. That leaves the issue inconclusive and cannot be applied to the current study.

## **2.13 Modeling strategic relationships for process re-engineering**

According to Yu (2012), who holds a similar view to Thompson D (2011), when a process is developed or redesigned, there are usually several alternatives, each with different implications for various stakeholders that may have an interest in the process. His view in his study includes that it is a challenge to identify, evaluate, and select the process alternatives that are aimed at addressing many business process related issues and concerns. It is thus against this background that he advocates that a systematic, engineering approach that employs appropriate models, analytical techniques and known design methods, would facilitate the task of process improvement and design, increasing the chances of success and potentially leading to more effective technical systems, by establishing clearer links between process design decisions and technical systems alternatives. In the study, the term reengineering was used to emphasize the business process improvement. Again, this study finds its relevance to the current study by means of highlighting the business process improvement which is the aim of the current study.

## **2.14 National Building Regulations' Business Processes**

Given the above literature, the current study is outlined based on the National Building Regulations' business processes for regulatory compliance within the built-environment and the building industry, as shown in Figure 3 below. For the current study, the current business processes of the NRCS must be taken into consideration based on the fact that the NRCS, through its Building Regulator Division, is responsible for creating a uniform understanding and implementation of the Act. This is achieved through the following sub-processes:

- Administering the Building Regulations' Review Board where there is an appeal against a Local Authority for non-approval of building plans submissions;
- Evaluate the qualifications of Building Control Officers who are responsible for assessment and approval of building plans submissions to Local Authorities;
- Conduct building investigations and architectural forensics where non-compliance is suspected and/ or where structural defects are encountered due to failure to comply with building regulations;
- Provision of technical advice for uniform understanding and implementation of the Regulations in terms of its legislative mandate.

The Figures 4 and 5 below describes the current management structure and activities which are based on the Act, with its last amendment in 2008. The context of the legislation has since not been revised to address the changes occurring within the built environment and the building industry. It is thus against this background that where the legislation may not be easily amended, its business processes, systems and systems modeling together, in line with policies and procedures, must be revised. Given the literature analysed thus far, the conceptual framework in Figure 3 below is used to guide the collection, analysis and interpretation of data to determine Building Regulations, regulatory compliance requirements and stakeholder relations as affected by the legislative mandate.

The conceptual framework is based on a four stakeholder-relationship process namely:

- The Regulator – the National Regulator for Compulsory Specification;
- The building owner and/ or building owner's representative;
- Built-environment Practitioners – architects, builders, engineers, legal representatives and so on, as appointed by the prospective or the building owner; and
- Local Authorities – represented by the Building Control Officers.

**Figure 3: NRCS - NBR Business Processes**



**Source: National Regulator for Compulsory Specifications – 2008**

The National Regulator for Compulsory Specification, comprising of the National Building Regulations as one of its core divisions, is responsible for a uniform understanding and implementation of the Act. As much as this legal mandate affects all South Africans, it is triggered by the following processes as outlined in Figure 4 below. The National Regulator for Compulsory Specifications, as a Regulator, plays an oversight role in ensuring that all citizens occupy safe, healthy and environmentally friendly, as well as sound quality buildings by ensuring that administrative, technical and regulatory requirements of the legislation are complied with across the building spectrum.

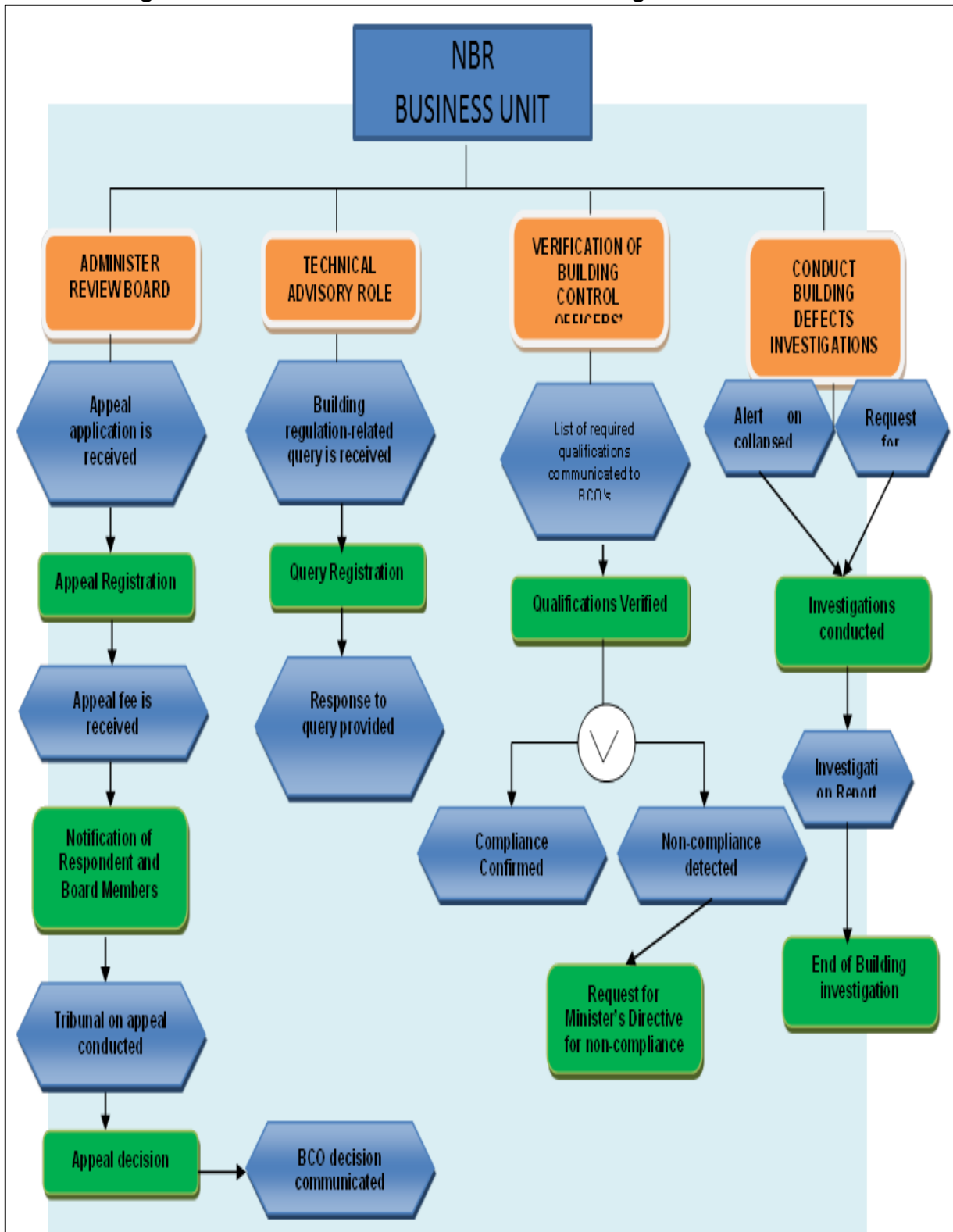
This is undertaken when a prospective building owner, or prospective building owner's representatives, approaches the local authority for submission of building drawings to enable

the local authority to assess the submission against the Regulation. The local authority's approval of the building plans is followed by progressive building inspections at regular intervals. This process is aimed at confirming that the prospective building to be developed meets all the Building Regulation requirements. This ensures that the end product, a completed building structure, will be safe, healthy and hazard-free for human habitation.

Where these submissions are not approved, the local authority refers the matter back to the Regulator by advising the owner of the building to make an appeal submission to the Review Board of the National Building Regulations through the Regulator, who now plays a secretariat role in the Review Board to ensure that the Board is independent and impartial, and that its decision or outcome of the appeal is not influenced by the prospective owner of the building (the Appellant) or the affected local authority (the Respondent).

The Building Regulator Review Board, upon receipt of an appeal application from the prospective building owner or his representatives, who automatically becomes an Appellant in this Regulatory process, will summon the affected local authority as a Respondent to the submitted appeal case to attend the hearing. The outcome of the hearing by the Building Regulator Review Board will determine whether the matter is elevated to a South African court of law; the local authority upholds or reviews the building drawings' submission. The process is further elaborated below in Figure 4 below.

Figure 4: NRCS- NBR's Current Business Management Processes

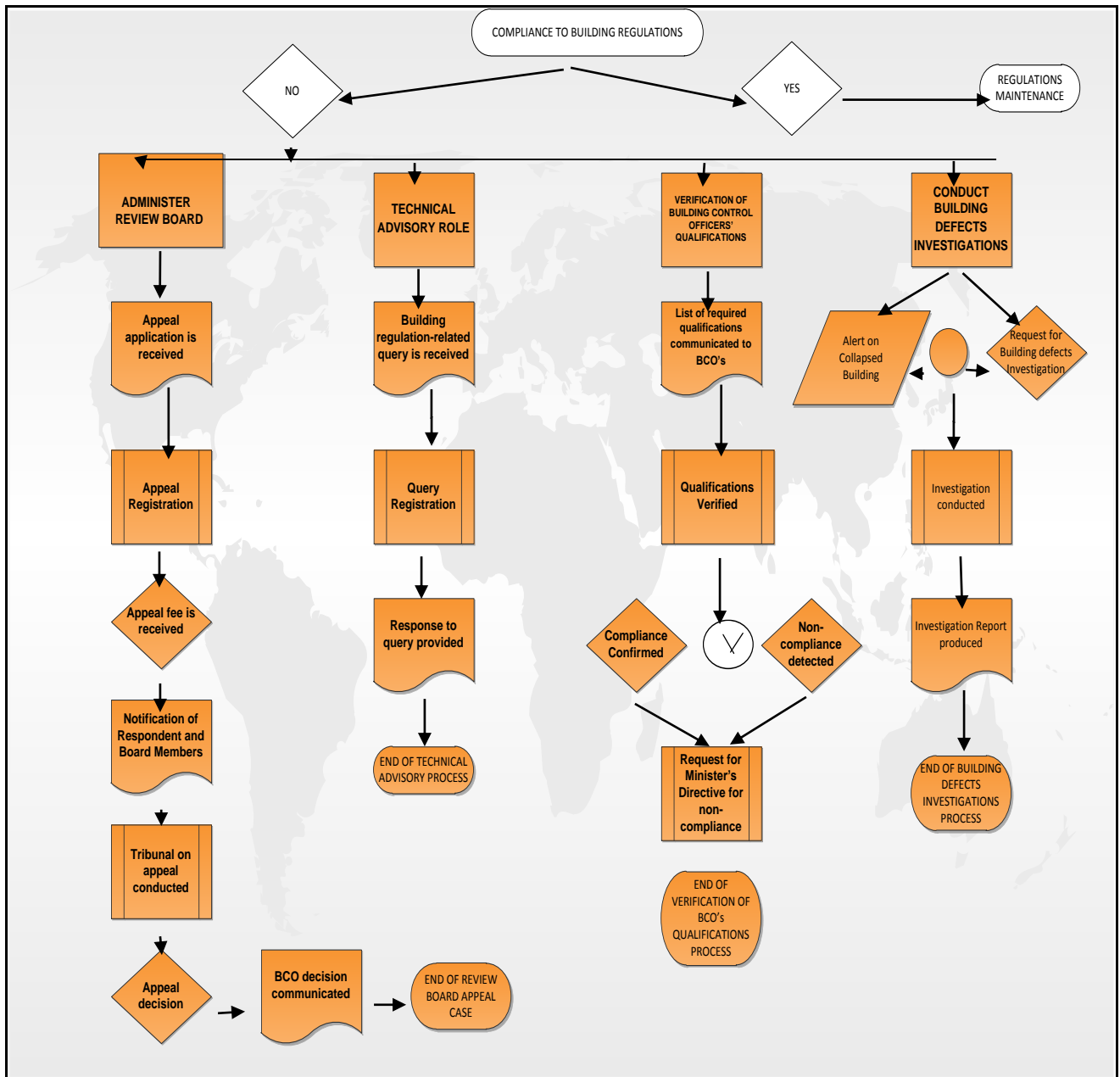


Source: National Regulator for Compulsory Specifications – (2008)





**Figure 5: NRCS Building Regulations Conceptual Framework**



**Source: National Regulator for Compulsory Specifications – (2008)**

Given the literature reviewed above, the conceptual framework then used to guide the collection, analysis and interpretation of data to determine building regulatory compliance requirements and stakeholder relations, as affected by the legislative mandate. The framework outlines the stakeholders and their relations as well as defining the stakeholders' roles and responsibilities.

## 2.15 Summary

The reviews by Laubscher (2011) and Watermeyer (2013) are contended by the current study as both the discussions did not address the implementation of the Building Regulations from its origin, i.e. the business processes and modeling, as well as the inadequacies of implementation of regulatory business processes which resulted in catastrophic incidents occurring within the built-environment and building industry.

The discussions shied away from tackling the cause of building defects, catastrophic incidents and accidents, and why buildings still collapse despite the confirmation of existence of building statutory codes for quality buildings and structures, and sound building workmanship. Therefore, review of current building's regulatory framework is essential to bring about the effectiveness and efficiency in the National Buildings Regulations and to eliminate catastrophic events.

Further review by Jeston and Nelis (2014) as mentioned above, confronts the challenge faced by the NRCS in terms of the lack of successful implementation of the Building Regulations processes by affirming that business process management, as a business process improvement tool, can be used with or without technology as a significant contributor to the achievement of the organisational objectives through improvement, on-going performance management and regularisation of essential business processes. Therefore, the Regulator is left with no further options but to consider the key elements outlined in business process management to turn the situation around to achieve its output of safe, healthy and environmentally friendly buildings that are suitable for human occupancy, namely:

- Focus on achieving the organizational objectives;
- Focus on improvement;
- On-going performance review and management; and
- Regularisation of essential business processes.

## CHAPTER 3: RESEARCH APPROACH

### 3.1 Introduction

Chapter 2 focused on reviewing literatures and studies undertaken, relating to the existence of the National Building Regulations as legislation and its application. A conceptual framework was therefore developed to guide the research methodology process. In this Chapter, the research approach is advocated in order to address the problem statement described in Chapter 1 above, highlighting catastrophic incidents that occur within the built-environment and the building industry while the National Building Regulations, as legislation, is in place. This study applies the interpretive approach underpinned by qualitative methodology where interviews were used to collect data. This approach is aimed at determining the following:

- a) Objectivity;
- b) Level of effectiveness, efficiency and proficiency of systems and processes;
- c) Stakeholder identification, engagement, participation and awareness;
- d) Service needs and gap analysis;
- e) Service and cost beneficiary analysis; and
- f) Outlined key input and outputs.

### 3.2 Overview of Case Study

NBR Business Unit within the National Regulator for Compulsory Specifications is responsible for ensuring uniformity in understanding, interpretation and implementation of the Act within the built-environment. There is a relationship between the processes and systems in determining the impact of implementation of the Building Regulations. Both the latter aspects of framework led to the data being collected from and analysed based on all four-levels of stakeholders, as outlined by the framework and illustrated in the stakeholder reference Table1 below:

**Table 1: Stakeholders and levels definition**

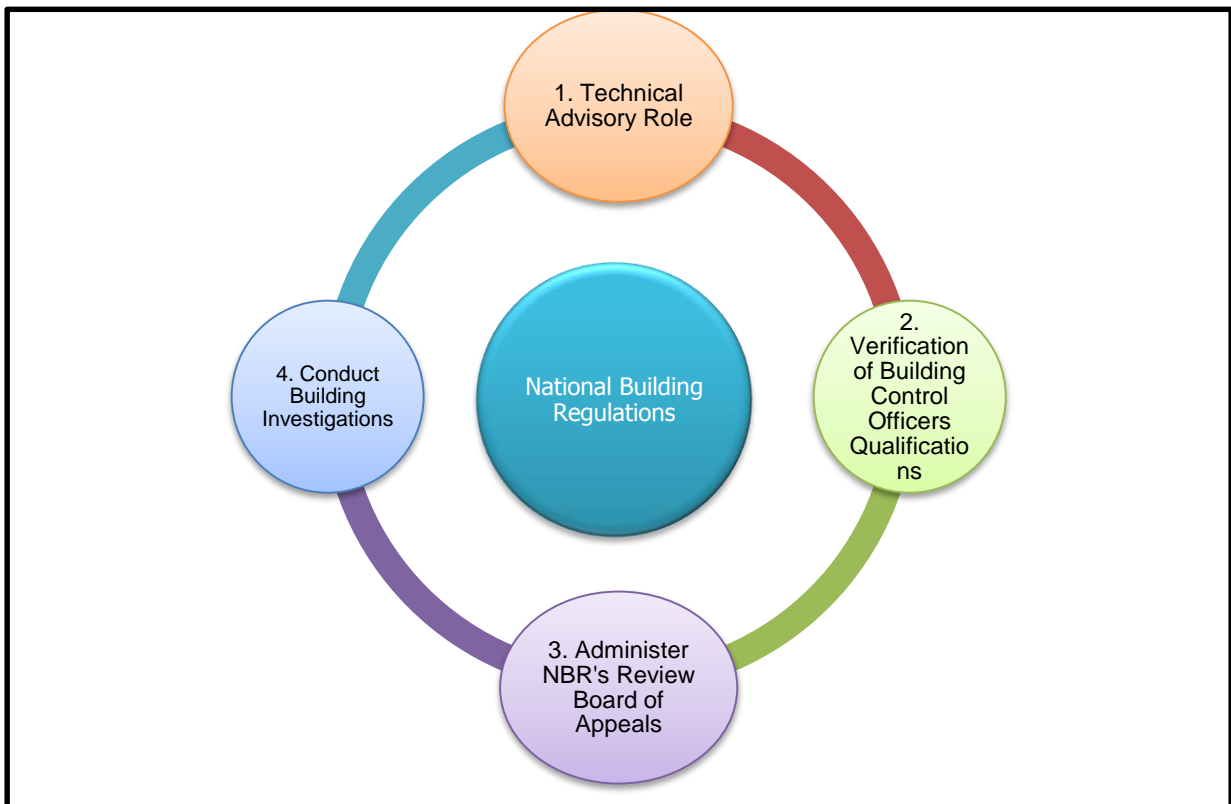
<b>CATEGORY</b>	<b>STAKEHOLDER REFERENCE</b>
Level 1	Building Owners/ Prospective Building Owners / Building Occupants
Level 2	Built-environment Practitioners
Level 3	Local Authorities' Building Control Officers
Level 4	NRCS - The Regulator of the National Building Regulations

**Source: Study referencing**

- a) **STAKEHOLDER 1:** The building owner and/ or building owner’s representative.
- b) **STAKEHOLDER 2:** Built-environment Practitioners – architects, builders, engineers, legal representatives and so on, as appointed by the prospective or the building owner.
- c) **STAKEHOLDER 3:** Local Authorities – represented by the Building Control Officers.
- d) **STAKEHOLDER 4:** The Regulator – the National Regulator for Compulsory Specification.

The existing interlinked business processes and systems considered for the study’s data collection and analysis are outlined in Figure 6 below:

**Figure 6: NRCS – NBR Current Business Operational Processes**



Source: National Regulator for Compulsory Specifications – (2008)

a) **SUB-PROCESS 1:**

Provision of technical advice for uniform understanding and implementation of the Regulations in terms of national building regulations by all stakeholder categories.

**b) SUB-PROCESS 2:**

Evaluation of qualifications of Building Control Officers responsible for assessment and approval of building plans submitted to local authorities to ensure that the prospective buildings are safe, healthy, environmentally friendly and suitable for human occupancy.

**c) SUB-PROCESS 3:**

Administering of the National Building Regulations' Review Board to ensure the fairness and transparency in the enforcement of regulatory requirements by the local authorities and protecting the rights of prospective building owners, occupants and/ or their representatives when submitting building plans for approval by the local authorities' Building Control Officers.

**d) SUB-PROCESS 4:**

Conduct building investigations and/ or architectural forensics as an impartial party where there is a request from any party for verification of compliance of a particular structure, against the object of the Building Regulations, for health, safety and environmental regulatory requirements.

The administering of the National Building Regulations' Review Board by the Regulator, i.e. NRCS, is undertaken when a prospective building owner, or prospective building owner's representatives, approaches the local authority for submission of building drawings to enable the local authority to assess the submission against the Regulation. The local authority's approval of the building plans is followed by progressive building inspections at regular intervals. This process is aimed at confirming that the prospective building, to be developed, meets all building Regulations' requirements. This ensures that the end product, a completed building structure, will be safe, healthy and hazard-free for human habitation.

Where these submissions are not approved, the local authority refers the matter back to the Regulator by advising the owner of the building to make an appeal submission to the Review Board of the National Building Regulations, through the Regulator, who now plays a Secretariat role in the Review Board. This is done to ensure that the Board is independent and impartial, and that its decision or outcome of the appeal is not influenced by the prospective owner of the building (the Appellant) or the affected local authority (the Respondent).

The Building Regulator Review Board, upon receipt of an appeal application from the prospective building owner or his/ her representatives, who is a built-environment practitioner, viz. An architect, engineer, contract's attorney, etc. who automatically become an Appellant's representative in this regulatory process. The Review Board summons the affected local authority as a Respondent to the submitted appeal case to attend the hearing. The outcome of the hearing, by the Building Regulator Review Board, will determine whether all affected parties acted within the requirements of the Building Regulations and regulatory requirements, and accordingly pronounce the decision.

Built-environment practitioners are affected by the regulatory processes at all angles as they play multiple roles in compliance to the Building Regulations, in that they represent the building owners' designs in submission to the local authorities for building plans approval prior to the actual building process. They are also required to build a structure within the confinements of the Building Regulations during the construction phase, and to issue the structural guarantee certificates. Compliance to all the requirements, as prescribed by the Act, for enforcement by the local authorities, results in compliance with the NRCS' Technical Regulatory compliance for administering the Act, thus confirming the safety, health and environmental state of the building and suitability for occupancy.

### **3.3 Research Design**

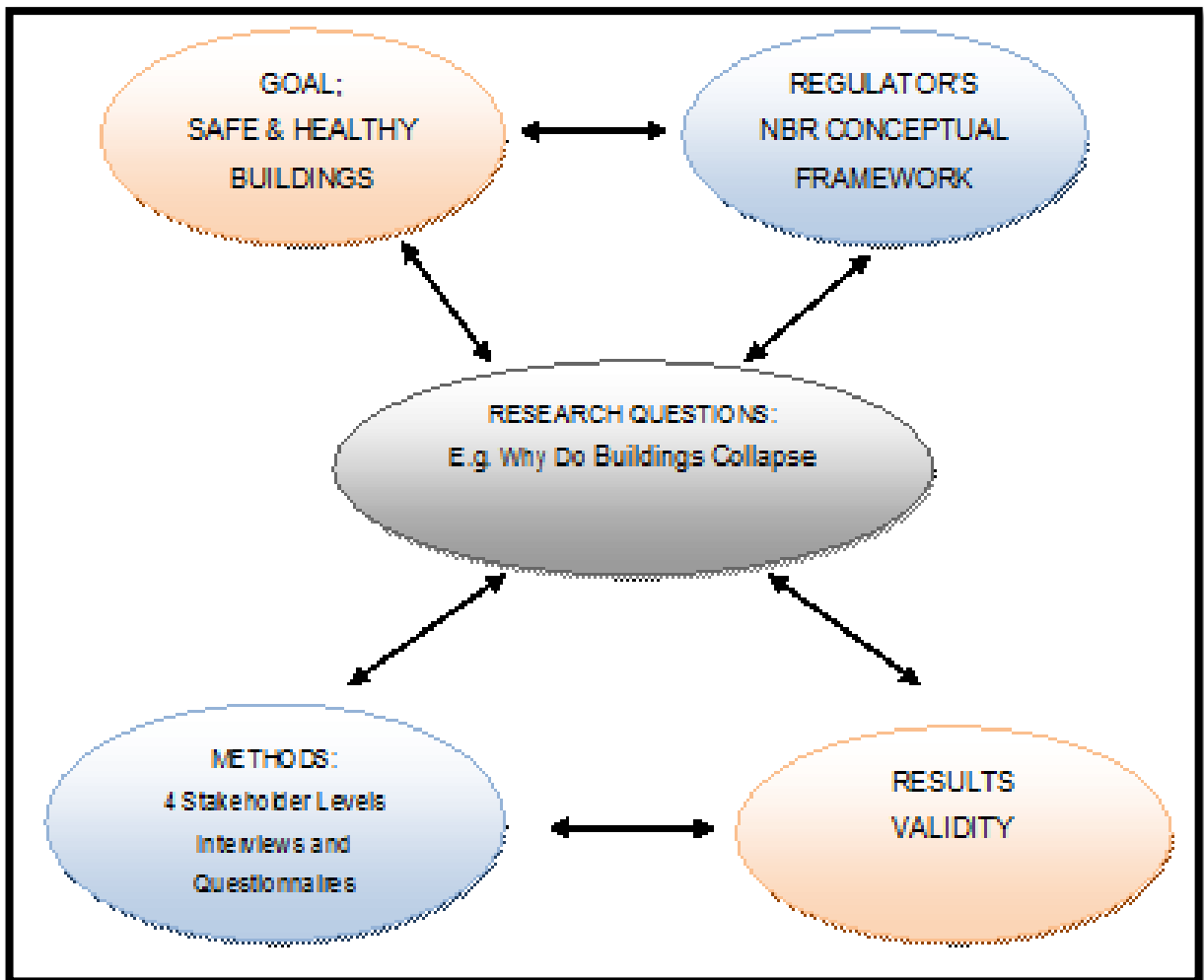
The study is framed around a qualitative methodological approach (Maxwell, 2005) called "Qualitative Research Design", where the conception of the study's design as a model has proven that initially the current study had no pre-empted design or well-worked-out set of hypotheses that was tested, and that there was no data-gathering instruments purposely designed to secure information with regards to the redesigning of the core processes of the National Building Regulations. In this study, the choice of qualitative research design has been further supported by the fact that during the research stages, no set of analytical procedures were specified in advance. According to Maxwell (2005) in so far as the term design is concerned, particularly on a qualitative study like this one, logical strategy cannot be developed in advance and be purposefully and objectively implemented. It is therefore against this background that the qualitative methodological approach is opted for as its interrelated components are applied, as outlined in Figure 3.3 below, for assessment of the key imperatives

of the study to meet the study's objective of re-designing the core business processes of the National Building Regulations, namely:

- [i] Goals: Assessing the implications of the goals to ensure uniform understanding and implementation of the National Building Regulations thus ensuring safe and healthy building of sound quality that meets the environmental sustainability objectives.
  
- [ii] Conceptual Framework: Understanding the theories around the Regulator's current Regulatory Framework within the built-environment and building industry as well as other related issues, settings, and beliefs prior to the research findings. For example, the belief that buildings collapse due to short circuiting of quality and compliance processes by the builder for quick economic gains, while the implications of collapsing buildings results in catastrophic incidents.
  
- [iii] Research questions: To specifically understand what the study is intended for, i.e. why do buildings collapse when there are Building Regulations?
  
- [iv] Methods: The current study required that all four levels of stakeholders that are differently affected by the implementation of the National Building Regulations, as outlined in Chapter 2 above, be consulted and engaged in a research methodology process. Thus, the interview questionnaires were prepared categorically in a manner in which the respective stakeholder is affected by the Building Regulations (See Table 1 above). A structured-interview questionnaire outlined its purpose, the targeted stakeholder category, and/ or level and its nature of confidentiality.
  
- [v] Validity: Threats that may occur due to incorrect or inconclusive results and/ or results' interpretations. The alternative interpretations and validity processes must be established together with the portfolio of evidence as to why the recommendation for re-designing process can be considered.



**Figure 7: Structure of research design**



**Source: Own study referencing**

The advantages and disadvantages of the proposed approach pertaining to the study are outlined and noted below:

- This approach gives effect to an interactive and systematic model where there is an active role played by all parties affected by the Act.
- Participants may respond to the questionnaire form for self-gain and/ or for pursuing ones own personal/ self-interest.
- Information is verifiable against all currently existing building Regulations and the Regulator's current regulatory framework in buildings.
- Keeness of participants to the interview and questionnaire process.

According to Hofstee (2006), research design names and discusses the overall approach to be used to test the study's statement. In concurrence with Hofstee (2006); as to exactly how the standard research design will be adapted and applied to the study, will be discussed in detail in the next methodology section below.

This section has discussed the techniques to be used for research study as well as the strengths and weaknesses of those techniques as they apply to the core business processes of the National Building Regulations of South Africa.

### **3.4 Methodology**

#### **3.4.1 Background**

In the current dissertation, a qualitative case study approach has been applied, providing tools to analyse the built-environment and building industry's phenomena within the National Building Regulations context Baxter and Jack (2009). This methodology is aimed at:

- Assisting in developing theory from the studies reviewed on catastrophic incidents occurring within the built-environment and building industry within the ambit of the National Building Regulations;
- Re-evaluating the status quo of the implementation of the National Building Regulations; and
- Developing interventions where gaps and inadequacies are identified in the study, resulting in the recommendations for re-designing of core business processes of the National Building Regulations.

#### **3.4.2 Data Collection**

Data collection process entailed identification of all stakeholders affected by the implementation of the National Building Regulations. The identified stakeholders completed four (4) different questionnaires targeting four (4) different stakeholder levels affected by the implementation of the National Building Regulations at various levels. Data was thus collected by means of one-on-one interviews and completion of the questionnaires by various stakeholders categorised in levels one (1) to four (4) and referenced, as outlined in Table 1 above. Interviewees were identified from the built environment's sector and business information's sphere. The following outcomes are anticipated from each stakeholder during the stage of collection of data at each level:

- Knowledge about the Building Regulations;
- Generic and technical understanding of the application of the Building Regulations;
- Highlights the benefits of the Regulations;
- Highlights the gaps and the limitations of the Regulations and regulatory processes;
- Proposes the mitigation where shortcomings are identified and enhances the current status quo where quick wins are highlighted;
- Highlights the impact of compliance as well as that of non-compliance; and
- Flags the areas of improvement.

The study is to collate all the data and test against the problem statement for recommendation to address the identified problem upon verification of data collected.

### **3.4.3 Data Preparation**

During the preparations for this study, cognizance has been taken to recognize and clarify the vision and objectives of re-designing core business processes of the National Building Regulations of safe and healthy buildings, suitable for human occupancy. This process included, determining the design techniques as outlined in Clause 3.3 above - Research Design. An interview checklist was further developed, together with a process to identify interviewees who are the stakeholders affected by the implementation of the Building Regulations, and how they would be uniformly approached as a collective method.

Interviews were considered as the most suitable tool for the study being undertaken because of its uniformity and richness to be derived from qualitative data. The tool enabled the study to source information on individual perspective and the verification thereof against the collective perspective. Where most common facts are identified from various sources through interviews and the completion of questionnaires, it can be safely stated that the outcome of the research is congruent, relevant and meets the objective of the study.

### **3.4.4 Interview questions**

The developed interview questionnaire addresses the following broad and cross-cutting issues, relating to the enforcement and implementation of the National Building Regulations and its impact:

- An understanding of the regulatory compliance requirements within the built environment.

- The nature of service provision by the National Regulator for Compulsory Specifications' Building Regulator Division.
- The current status quo of the government's Ministry of Trade and Industry's legal mandate for technical regulations, viz. building Regulations and other building practices and methods for compliance to the Act, as administered by the NRCS for enforcement by the local authorities' Building Control Officers.
- An assessment of the current business processes of the Building Regulator to meet its objective of effectiveness and efficiency.
- Perspectives on the nature and appropriateness of the Regulator's current roles and responsibilities, for amendment and verification of the regulatory business processes and systems for effectiveness, efficiency and proficiency.
- Awareness by citizens of their rights in terms of safe, healthy and habitable buildings. If not, to outline where the problem and its associated solution(s) lies.
- To assess possible solutions or intervention strategies from the professional practitioners and the enforcers of the Regulation, for the best possible mechanisms to improve the Building Regulator's business processes as well as levels of service awareness.

### **3.4.5 Data analysis and interpretation**

For data analysis in this current study, which is extensively discussed in Chapter 4 below, deductive content analysis was used by applying key points coding and/ or category analysis Allan (2003); Graneheim et al (2004); Hsieh et al (2005); Elo and Kynga (2008); Elo and Kääriäinen et al (2014). From the literature, it shows that content analysis is a method which is suitable for use when analysis of written, verbal or visual communication messages is required; in this research interview, text was analysed. A deductive content analysis approach is useful if the general aim was to test a previous theory in a different situation Elo and Kynga (2008).

Since the theory in this study, which focuses on the verification of effectiveness, efficiency and proficiency of National Building Regulations Business Processes and systems, exists, it was therefore appropriate to apply deductive content analysis to test the South African regulatory processes' context. For this study, structured interview questionnaires categorised into four levels of stakeholders affected by the Act, were used which were developed from literature review. Categorised stakeholder levels risks from literature review are namely:

- Level 1: Building owners/ prospective building owners / building occupants;
- Level 2: Built-environment practitioners;

- Level 3: Local authorities' Building Control Officers;
- Level 4: NRCS - The Regulator of the National Building Regulations.

Stakeholder categorisation, as a process to organise and sort transcribed interview data was used Graneheim et al (2004). The transcribed interview data derived from the categorisation, which fits the category of each one of the four stakeholder levels, was chosen. All aspects of data met and fitted well into different categories that emerged from the research Elo and Kynga (2008). The structured questionnaire interview's response data was used to identify the unique patterns from all four categories of stakeholder levels within the data for a single context. Furthermore, the interview response data examined provided insight into finding out the similarities and differences Eisenhardt (1989). Overall case analysis is when all the data from all categories of stakeholder levels' cases are combined to come up with overall findings, hence the basis of the submission.

Sampling method used in this study was based on randomly identifying, using snowballing techniques, willing participants based on the 4 stakeholder categories, namely:

- Level 1: Building owners/ prospective building owners / building occupants;
- Level 2: Built-environment practitioners;
- Level 3: Local authorities' Building Control Officers;
- Level 4: NRCS - The Regulator of the National Building Regulations.

Together with a disclaimer form, willing participants per specific targeted stakeholder category were interviewed in sampling batches of 5 per stakeholder category.

**Participants/ Respondents were obtained as follows:**

**LEVEL 1: BUILDING OWNERS/ PROSPECTIVE BUILDING OWNERS / BUILDING OCCUPANTS:** Individuals were randomly approached using snowballing techniques either as the building owners or occupants.

**LEVEL 2: BUILT-ENVIRONMENT PRACTITIONERS** - Various sites under construction and nearby Practitioner's Offices were visited where Contractors, Site Managers, Property Developer, An Architect and an Engineer/ Lecturer were interviewed.

**LEVEL 3: LOCAL AUTHORITIES“ BUILDING CONTROL OFFICERS** - Building Control Officer's Annual Convention 2014 in Durban ICC was targeted where approximately 250 BCOs gathered. BCO specific questionnaire was circulated for willing participants to anonymously respond to the questionnaire with a disclaimer.

**LEVEL 4: NRCS** - The Regulator of the National Building Regulations - All NRCS Executives and staff members were randomly interviewed. Disclaimer also taken into consideration.

**Reasons for Participants/ Respondents per category (Level) were as follows:**

**LEVEL 1: BUILDING OWNERS/ PROSPECTIVE BUILDING OWNERS / BUILDING OCCUPANTS** - This level of respondents displayed a level of lack of information in terms of the object of the legislation and did not see the benefits o of National Building Regulations.

**LEVEL 2: BUILT-ENVIRONMENT PRACTITIONERS** – A level of skilled and knowledgeable individuals who understood the business processes of the National Building Regulations, how who on several cases chooses not to comply to the legislative requirements due to no severity of penalties or no penalties at all to non-compliance to the NBR & BS Act 103 of 1977 and its object of ensuring safety of buildings for human occupancy.

**LEVEL 3: LOCAL AUTHORITIES“ BUILDING CONTROL OFFICERS** - Building Control Officer's responses revealed a high level of frustration due to the important role they play in ensuring the safety of buildings; however with limited powers and no recognition in terms of the vale they add to meet the object of the legislation, i.e. NBR & BS Act 103 of 1977.

Their reasons were also motivated by fragmented processes of different government structures at different levels which have an adverse impact on the enforcement of the Act by BCOs at Local government level while administered by the Regulator at a National Government level.

**LEVEL 4: NRCS** - The Regulator of the National Building Regulations acknowledges the inefficiencies of the National Building Regulations business processes and that they would like to see the re-designing and or re-engineering of the existing processes to cater for all affected stakeholders for effective and efficient regulations through business processes.

### **3.5 Summary**

This Chapter focused on the approach undertaken to collect and gather information as a research study for this dissertation to determine the validity of the problem statement. The problem statement outlined the inadequacies of the National Building Regulations' business process, systems and its implementation. The information was gathered in a form of interviews and completion of questionnaires by all stakeholder levels affected by the Act.

The next Chapter focuses on the findings and discussions undertaken on the analysis of the results of the interviews. Further, the next Chapter maps out the discussions covered and aimed at, determining whether there is a need to redesign the core business processes of the legislation concern as per the study, or whether the status quo should remain in support of the current processes of the National Building Regulations.

## CHAPTER 4: FINDINGS AND DISCUSSIONS

### 4.1 Introduction

The previous Chapter focused on the research design and methodology applicable to the current study being conducted and the research that was used to collect and analyze data to address the objectives of the research. The Chapter which follows further discusses the field work and ethical issues considered. Furthermore, Chapter 4 discusses how data collected in Chapter 3 is analysed and interpreted in line with the literature and the conceptual framework. It discusses the impact of the implementation of the National Building Regulations' business processes has on the safety, health and environmentally friendly buildings for human habitation.

### 4.2 Results Discussion

The importance of building Regulations has for centuries been emphasized in support of the building industry, consumers, and building occupants as well as the economy. This is witnessed through continuous collapsing of buildings and the impact it has on the economy that highlights the gaps, and the limitations, that exist in the regulation of buildings in South Africa which in contrary is aimed at ensuring the safety, health, environmental friendliness of buildings for human occupation. To tackle this misalignment, the data collected, as outlined in Chapter 3 from all stakeholders' levels affected by the Building Regulations in accordance with their user categories, is unpacked, discussed and the discussion findings presented for interpretation and conclusion in the final Chapter of this research study.

### 4.3 Overall Results

Questions were developed and subdivided according to stakeholders' categories and addressed based on the research background and problem statement as follows:

**(a) Stakeholder Category: Level 1 - Prospective home owners, home owners, building occupants, and or/ their representatives**

QUESTIONS	RESP ID	RESPONSES
1. What basic and legislated rights are	1	None.
	2	None, except that before a house is built, building plans must be approved.



QUESTIONS	RESP ID	RESPONSES
<p>are you aware of to ensure that you occupy a safe, healthy and hazard-free building?</p>	3	Yes – Building Inspectors from Local Authorities are there to ensure that buildings are safe. That is a basic right that is somehow legislated somewhere.
	4	Do not know – probably building inspections and NBR.
	5	Not aware of any.
<p>2. Do you know of a mechanism that a Government has put in place to ensure that you occupy a safe, healthy and hazard-free building? If yes, what are these? If not, why not?</p>	1	No, there are no public campaigns on building processes. Technical issues within the built environment are often preserving of Engineers.  In addition, citizens only need shelter and its conditions seem to be secondary to this basic need.
	2	No, none that is related.
	3	Yes, as per the previous answer, there are Building Inspectors.
	4	Same as above – Do not know anything about Building Regulations.
	5	None.
<p>3. Do you know of any recourse, should a life be exposed to danger due to unsafe, collapsed or defected building? What recourse (s) do you know? If not, why not?</p>	1	None, because as Citizens, we never get to be notified of these recourses.
	2	Yes – Department Of Labor and its investigation & compensation processes.
	3	None.
	4	Police, Regulators of buildings and the Building Owner.
	5	Nothing.
<p>4. In your opinion as an ordinary citizen, causes building structural defects, dilapidation, and</p>	1	Poor planning, lack of proper project management and silo mentality within professions.
	2	Poor workmanship, material and quality and lack of building skills.

QUESTIONS	RESP ID	RESPONSES
structural failure and/or building collapses?	3	Sometimes builders are not reliable, cutting corners; hence inspections are of importance in the entire process. For example: look at RDP Houses – Inspections play a very important role.
	4	Buildings are not properly managed, poor quality and cheap material and lack of skills for building safe and sound houses.
	5	Theft, poor quality structure due to theft of material and poor re-enforcement.
5. Do you know of the legislative and compulsory role you have to play in ensuring the safety of your building? If yes – what is it? If not, why not?	1	No, only know personal responsibility as a citizen, one is often indifferent about one's legislative and compulsory role in the said process.
	2	Know only submission of plans..
	3	Yes - Building Plans.
	4	Building drawings, approvals and building drawings.
	5	Insurance, nothing more.

**(b) Stakeholder Category: Level 2 - Built-Environment Practitioners**

QUESTIONS	RESP ID	RESPONSES
1. Do you find the National Building Regulations as a legislative mandate to be effectively implementable	1	Not, National Building Regulations as a legislative mandate it is not assisting at the moment except for approval of building plans.
	2	Yes, it gives guidelines to compliance and as a result buildings are guaranteed to be safe, healthy and to be

QUESTIONS	RESP ID	RESPONSES
and implemented? If yes – how so? If not, please mention its failures.		environmentally friendly for human occupancy as per the objective of the NBR & BS Act.
2. What is the compliance scope of requirements?	1	Submission of building plans for approval not necessarily for the safety, healthy and environmentally friendly buildings. The object of the legislation has become secondary and no one seems to care what the National Building Regulations & Standards Act as well as other building practices were intended for. I would even mention that there is malicious compliance by the Built environment Practitioners. The Regulator is also not playing its part.
	2	That Building construction planning must be in line with the building regulations.
	3	None - really.
2. As a Professional Practitioner, what risks are you exposed to if you are found to be non-compliant.	1	Only building plans may not be approved, but there will be no risk to one's profession. Should you get away with by-passing the compliance process and get caught, little can be done by the Regulator or Building Control Officers unless if the structure collapses and draws media and national attention. So as a Practitioner, you get away with a lot of wrong doing without any penalties or recourse to building owners or occupants.
	2	<ul style="list-style-type: none"> <li>• Professional de-registration</li> <li>• Legal Action</li> <li>• Termination of professional practitioners' status</li> </ul>
	3	Affiliations with Masters Builders Associations promote compliance to NBR & BS Act and other building practices.
4. What is the recourse and how often does it occur that punitive measures are taken	1	As mentioned earlier, little can be done by the Regulator or Building Control Officers unless if the structure collapses and draws media and national attention. So as

QUESTIONS	RESP ID	RESPONSES
(if any) when a professional is found to have contravened the law, i.e. NBR Act?		a Practitioner, you get away with a lot of wrong doing without any penalties or recourse to building owners or occupants. It is as if, it is at the discretion of the Building Control Officer as to whether punitive measures can be taken against the Professional Practitioner.
	2	(a) Recourse: Legal action against the Practitioner and probably compensation for the victims (b) Measures against Practitioner: As above.
	3	Due to Industry preference to self-regulate – non-compliances, punitive measure and recourse plan become irrelevant.

**(c) Stakeholder Category: Level 3 - Local authorities – Building Control Officers**

QUESTIONS	RESP ID	RESPONSES
1. How is the level of compliance determined to the National Building Regulations determined by the Local Authorities?	1	This is done by evaluation of plans and the decisions made to plans been submitted. Inspections are carried out to measure compliance to the approved plans and regulations.
	2	Through the evaluation and decision making process relating to building plan submissions. Through the building inspection process in determining whether buildings are indeed erected in accordance with the approved plan and regulations. Through the law enforcement process. All the actions/outcomes in the above processes are logged into statistical reports through which different levels/trends can be determined.
	3	A Building Control Officer and Building Inspectors have been appointed by Tlokwe City Council. Approval for BCO appointment was given by SABS in 2001. There is compliance on that level.

QUESTIONS	RESP ID	RESPONSES
<p>2. What mechanisms do Local Authorities apply to ensure full compliance by Stakeholders to the Building Regulations for the safety of ordinary citizens?</p>	1	<p>All plans are properly evaluated and a decision taken. Inspections are carried out, and enforcement taken were non-compliance occurred.</p>
	2	<p>A proper evaluation and decision making processes of all building plan applications. Continuous compulsory inspections and routine inspections. Enforcement where non-compliance is discovered. Continuous interaction between the Local Authority and role players in the industry.</p>
	3	<p>Building plan approvals are done properly at Tlokwe City Council. Proper inspections are conducted.</p>
<p>3. Where non-compliance to Building Regulations is identified; what powers do Local Authorities have for corrective action?</p>	1	<p>Serving of notices and spot fines. Court proceedings are a major challenge to be successful.</p>
	2	<p>The issuing of "spot fines". The serving of notices and the subsequent summonses and magistrate court proceedings. In special circumstances High Court proceedings. The success of the above heavily rely on the accessibility of the courts which is in many instances one of the major challenges in being successful. (Dedicated courts together with updated legislation would be of great advantage in this process)</p>
	3	<p>The processes of prosecutions according to NBR against transgressions are very cumbersome and it is difficult to properly take action. Fines are also so low that it do not act as deterrent against transgressions.</p>
<p>4. Building regulations were developed for safety with a focus on formal building structures, in cases of informal structures which are highly risky; how do Local Authorities or Building Control Officers ensure that</p>	1	<p>This is a very big challenge and the housing section should be responsible for this. With backyard dwellers and formal and informal buildings, and to apply to all legislation, and Building Control had to deal with this social process.</p>
	2	<p>It should be noted that we are dealing with formal and informal (Act 113) areas. In formal areas we are dealing with all buildings (formal and informal) in the same way by</p>

QUESTIONS	RESP ID	RESPONSES
such occupants are safe in terms of the legislation?		fully applying the legislation. Building Control is however facing a social challenge within this process. Especially when it comes to informal back yard structures on a formal property with a formal primary building. For that reason the BCO Steering group brought these challenges to the DTI. We are awaiting the outcome. Informal areas are generally dealt with by the housing directorates
	3	No proper safety measures exist in Tlokwe City Council because there are no legislated guidelines for construction of temporary or informal structures. The department is currently also far too understaffed to implement any such measures, should it exist.

**(d) Stakeholder Category: Level 4 - NRCS**

QUESTIONS	RESP ID.	RESPONSES
1. What processes does the Regulator have to ensure safety buildings for all Citizens?	1	<ul style="list-style-type: none"> <li>• NBR Act enforcement.</li> <li>• Process of approval of building plans by Building Control Officers</li> <li>• Regular review of policies</li> </ul>
	2	Processes need to be designed to deal with all in the building's life cycle.
	3	As provided by the NBR & BS Act, e.g. Building Inspections and Investigations.
	4	There is an NBR & BS Act in place but no effective processes.
	5	The NBR & BS Act has given the Regulator the mandate.
	6	There is a Business Unit within NRCS responsible for regulating buildings – that is all that is known.

QUESTIONS	RESP ID.	RESPONSES
<p>2. Are those processes, if any; proven to be efficient and how so?</p>	1	There is a need for enforcement.
	2	Yes.
	3	Well, the National Regulator should be efficient or otherwise must review the NBR & BS Act.
	4	None.
	5	The National Regulator needs to develop effective processes and implement the mandate.
	6	Not sure, do not even know what that Business Unit does.
<p>3. If there is a Regulator with current processes, if any; why do buildings still collapse (e.g. Tongaat Mall – North of Durban, South Africa – Mall in November 2013)</p>	1	<ul style="list-style-type: none"> <li>• Developers not complying with the NBR Act</li> <li>• Developers not aware of the NBR Act.</li> <li>• Developers not following all approval requirements</li> <li>• Lack of mechanism to pro-actively identify non-compliances.</li> </ul>
	2	Do not know.
	3	Check other Regulators, i.e. National Home Builders Regulators Council (NHBRC), Construction Industry Development Board (CIDB), South African Local Government Agency, etc.
	4	Quality – I guess lack of Regulation in certain areas – Need for Compulsory Specifications in areas of construction.

QUESTIONS	RESP ID.	RESPONSES
	5	<ul style="list-style-type: none"> <li>• Sub-standard material u could be a problem</li> <li>• Unskilled labour</li> <li>• Monitoring of Building Construction by independent authority does not exist.</li> </ul>
	6	<ul style="list-style-type: none"> <li>• Poor strength of material</li> <li>• Corrupt Municipal Officials</li> </ul>
4. In a case of Tongaat Mall, what had been Regulator's response to the incident and what preventative measures have been established and/or reviewed?	1	Not sure.
	2	To investigate the course.
	3	Check whether the concerned Municipality is enforcing the Building Regulations in its jurisdiction, e.g. Building Plans approval.
	4	National Regulator failed in its upfront involvement as in construction processes.
	5	Do not know.
	6	Strength of material No. not everyone knows about the role of the National Regulator in this regard.
5. Does the Regulator condone, encourage, and support self-regulation? If so - how so? If not, why not?	1	Yes, self-regulation is encourage, however the National Regulator still need to do enforcement in line with the NBR & BS Act.
	2	Partially. The National Regulator needs to balance regulation and the cost VS. Risk.
	3	



QUESTIONS	RESP ID.	RESPONSES
		No, Industry cannot be trusted as yet to respond sufficiently to Consumer protection needs.
	4	No. Even if the National Regulator does, there should be no restrictions.
	5	Condone.
	6	Do not know.

**4.4 Analysis of findings**

**4.4.1 Introduction**

The analysis framework is based on the results obtained from various stakeholders randomly selected to answer the questionnaire based on the problem statement already identified, of which the current study was conducted.

This section of the study is the empirical analysis of the research, and the interpretation and discussion of the overall results of the study within a case study framework. This section then discusses the impact of the implementation of National Building Regulations business processes in the safety, health, environmental friendly building for human occupancy.

The following lessons were acknowledged and envisioned as possible considerations for future research:

- The respondents displayed a generally low level of awareness and understanding of the regulatory role of implementation of National Building Regulations. This primarily is projected from the building owners' input not recognising the government's imperative in ensuring safe buildings, and further to consider the government's imperative as an essential and a basic benefit to citizens at large.
- Lack of communication channels; issues of reliance on internal business processes and systems were raised in the case study.
- Inconsistencies of the enforcement of the legislation by various local authorities.

- Powers of the Regulator in ensuring compliance to the National Building Regulations as the Administrator of the Regulation, and playing an oversight role in the enforcement of the Building Regulations by the local authorities.
- Significant differences were recorded by the respondents at different stakeholder levels in terms of thorough understanding of the Regulatory dynamics in ensuring the implementation of the Regulations; this is crucial.
- A high level of non-responses was noted where stakeholders at various levels repeatedly stated “do not know” in their responses. This highlights the importance of the need to sensitize all citizens of the critical nature of the legislation, and how it impacts on all citizens day-to-day lives as all citizens are automatically occupants to one form of building or another.
- Finding out whether the implementers of the Building Regulations believe that their business processes and systems promote compliance to the legislation, and as a result support the safety, health and environmentally friendly buildings for human occupancy, as intended, and whether the regulated parties of those programmes agree that such programmes do, indeed, promote the objective and would be useful. Thus, the descriptive accounts of implementers and regulated parties, which were accessed by means of semi-structured individual interviews and collective interviews, respectively, are required to augment the survey results.
- The expectations of the Building Regulator’s stakeholders and their attitudes towards the implementation of building Regulations should be assessed in order to gain an understanding of the respondents’ appraisals of their perceptions of the Regulator’s business processes and systems, as well as the Building Regulator’s legislation giving effect to the administrative processes as governed by the Regulator.
- The NRCS has displayed to have missed out on an opportunity to identify the most powerful weapons of process mapping in the processes and systems management. NRCS collaborated with customers, stakeholders and end-users who displayed to have had no understanding of its business processes, both upstream and downstream processes, hence the problem of miscommunications, gaps, redundancies, workarounds, rework loops and waste could not be easily identified and thus being highlighted through this study.

In collaboration with other literatures reviewed, and in support of the study for redesigning the core business processes of the National Building Regulations of South Africa:

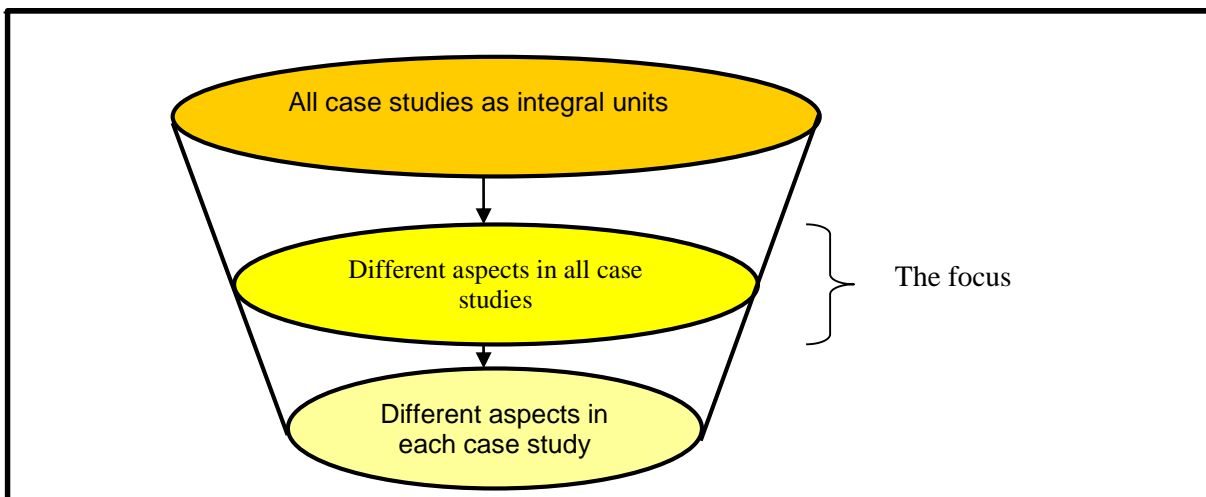
- What must be done by the NRCS to ensure efficient implementation of the Building Regulations?
- How should it be implemented in terms of processes and systems?
- Where should it be done in cognizance of all stakeholders affected by the Building Regulations as legislation?
- And importantly, why must it be done (through unpacking the objective of the Act)?

**4.4.2 Effectiveness of implementation of National Building Regulations business processes and systems at all stakeholder levels**

The data which was obtained in the present study has been used to establish the relationship between all stakeholders and the impact in relation to the Building Regulations:

- a) Between all the various stakeholders' studies or groups of case studies, taken as *integral units*, in terms of building Regulations;
- b) Between the different output and impact of the Building Regulations; and
- c) Between the different understandings of the Building Regulations at different stakeholder levels per case study. (See Figure 8 below).

**Figure 8: The case study data analysis approach.**



**Source: Own study referencing**

The current study was able to assess that the nature and importance of the Building Regulations in the case studies was both individualistic and institutionalised, possessing

different foci and lines of understanding. A comparison of the different aspects of all case studies shows that they seem also to have followed essentially disparate lines of perceptions, views, knowledge and understanding, from which certain distinctive features were found to be common. Clearly, then, not all citizens are aware of their constitutional rights of access to safe, healthy and environmentally friendly buildings suitable for human occupation.

A general interpretation of the study opens up the study to allow for an analysis of the consistency of those gaps from which the policy and administrative implications derive.

## **4.5. Interpretation of Findings**

### **4.5.1 Perception and expectation gaps**

#### *(a) Regulator understands the Regulated parties' perceptions<sup>1</sup>*

It is vital for both the Regulator and regulated parties to have consistent evaluations for successful building regulatory business processes and systems to transpire. Insufficient knowledge of the regulated parties' dispositions causes a gap to develop between the Regulator's perceptions of the regulated parties' perceptions and the actual perceptions of the regulated parties concerned. In the present study, the magnitude of the limitations and gaps which were discovered to be present were directly measured by comparing the Regulator's position on the implementation of the building regulatory processes and systems, and the corresponding responses by the regulated parties to their perceptions and expectations.

The greatest underestimation by the Regulator of the regulated parties' perceptions is a major indication of misalignment of understanding of the roles and responsibilities by all stakeholders affected by the Building Regulations within the built-environment. However, the regulated parties felt that they indeed lacked the understanding of the object of the National Building Regulations, its implementation and its impact.

The results support the finding, which hypothetically states that, there is *significant tensions that exist between the regulated parties' perceptions, and the Regulator's understanding of such perceptions*, resulting in partial rejection and/ or forced implementation of the Building Regulations and its building processes and systems. Thus, although gaps and limitations in the implementations of regulatory business processes and systems, as per the perceptions

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<sup>1</sup> *Building owners or representatives, built-environment practitioners and Building Control Officers*

between Regulator and Regulated parties are present, they are highly significant. Briefly, the results indicate that the Regulator overestimated the regulated parties' perceptions on all matters of understanding of the National Building Regulations. Such responses were found to represent discrepancies in the relevant perceptions, which indicated that improvement was required by the Regulator concerned.

*(b) The Regulator understands of the regulated parties' expectations*

Similar to the above Clause (a), this sub-heading indicates that there is a statistically significant difference in the expectations of understanding between the Building Regulations by the Regulator from those of the Regulated parties. Such results partially support the fact that the Regulator expected the regulated parties to uniformly understand, and be aware of, the following:

- Their basic and legislated rights to ensure that persons occupy a safe, healthy and hazard free building;
- Knowledge of a mechanism that a government has put in place to ensure that you occupy a safe, healthy and hazard-free building;
- Awareness of the recourse, should a life be exposed to danger due to an unsafe, collapsed or defected building;
- Causes of building structural defects, dilapidation, and structural failure and/ or building collapses;
- The legislative and compulsory role they have to play in ensuring the safety of buildings; and
- The compliance's scope of requirements.

This, again, indicates significant tension which exists between the regulated parties' expectations, and the Regulator's understanding of such expectations. Thus, gaps in expectations between the Regulator and regulated parties are present and they are also of high significance.

The regulated parties, as a result of responses, have a relatively important effect on the outlook of compliance to Building Regulations; hence their expectations must be met by the Regulator.

From the questions, there is an indication that the regulated parties, in general, were found to have a negative outlook and understanding of effectiveness and efficiency of the regulatory processes and systems for compliance to building regulations. The regulated parties were, however, positive about their local authorities approving their building plans which brought comfort to the level of compliance and for assurance of occupying safe buildings. Overall, the regulated parties' understanding of the Regulator's' expectations proved to be inadequate. Given that the regulated parties and the Regulator were found to differ in terms of several aspects, an in-depth examination of the regulatory processes and systems is needed in order to identify ways in which expectations, regarding building regulations compliance and assurance of occupation of safe buildings, can be changed and improved.

The main implication of the results of the study are that the Regulator was found to think that the regulated parties had already reached a required level of understanding of the regulatory processes and systems, in terms of building regulations, and thus, would not have felt that there should be potential improvement in the future; hence the legal mandate had not been reviewed since 1977 except for administrative content. The Regulator was, therefore, found to be unlikely to improve their programmes. The situation was more pronounced in respect of two aspects: The issue of employees receiving regular advice outside the organisation, or an individual for which they originated in terms of meeting the building regulatory requirements.

By implication, the Regulator did not highlight the critical role of service awareness which should now form part of regulatory business processes. Such a finding supports Moller and Dickow's (2012) three categories of responses, which consists of (i) those protecting privilege (built-environment practitioners); (ii) those fighting for social conformance (the building owners/ occupants and/ or their representatives); and (iii) those responding moderately to mobility (the 'local authorities' Building Control Officers).

*(c) Attitude towards, and progress in terms of, implementation of building Regulations business processes and systems*

Since the National Building Regulations' business processes and systems are developed with the intention to ensure compliance to the National Building Regulations, attitudes towards such processes require substantive understanding. Such an understanding can be achieved by exploring the importance of active roles played by relevant stakeholders in the compliance to

the Building Regulation's compulsory requirements. The Regulator and the regulated parties studies indicated that more developmental and awareness dimensions were required. The Regulator valued the existence of the Regulations, whereas the regulated parties tended to prioritise approval of building plans not as a safety, health and environmental factor, but simply as a permit to build a structure (with such a misalignment being found to be statistically significant and critical). With the existence of such a difference in attitude and perceptions, policy-makers have a serious responsibility of creating a harmonised understanding of the Regulations for change of attitude of all stakeholders to give way to efficient and effective business processes and systems that meet the legislative mandate's objective.

The consistency of the responses obtained from all levels of stakeholders affected by the Building Regulations have the perceived importance of the regulatory elements for building industry for the regulated parties by the Regulator, and the actual assessments of such elements according to their perceived importance by the regulated parties, was similar for most elements. The element on service awareness and uniform understanding and implementation of the Building Regulations are rated highly by regulated parties, but it has been placed as a residual element by the Regulator.

The findings which are contained above show that the Regulator is found to consistently overestimate the regulated parties' level of understanding, whether in general, or specifically, within their own prescripts. Regulated parties feel that the Regulator should improve in the developmental and stakeholder awareness. However, the latter findings indicate that both the regulated parties and the Regulator expressed a belief that the all parties directly or indirectly benefited from implementation and compliance points of view despite the level of knowledge. Such findings form part of the confirmation that the obsolescence of the legislation, gaps and limitations on the implementation of building Regulations and processes have disempowered the majority of South Africans who are supposed to be the beneficiaries of healthy, safe and environmentally friendly buildings for human occupation as their constitutional right, and as per the government's imperative.

*(d) Corroboration of gaps and limitations*

In terms of the current study, the areas in which relatively strong divergence of opinions between the Regulator and the regulated parties were found to be present, include the following:

- **Prioritising the primary object of regulating the built-environment:** Even though the Regulator considered themselves to be consultative, and in possession of a positive attitude, they thought that changing the regulated parties' mind sets would be a challenging task, given that the latter tended to be dependent on the former, with such dependency being driven by the 'unrealistic' expectations held by the latter. As a result, the Regulator believed that the focus should: Firstly, be on the tangibles (e.g. approval of building plans); and secondly, on the intangibles (e.g. awareness, satisfaction, and related qualities). In addition, the Regulator thought that, if the regulated parties were granted a tangible product, they would be more likely to feel sufficiently motivated to participate in compliance programmes. However, the evidence which is available with regards to failed regulatory processes, e.g. collapsed houses, shows that such priority is not favoured. In contrast, most regulated parties required training and the attainment of technical and administrative information in the short term in order to enable them to understand the object and benefits of regulating buildings of concern, as a basic constitutional right, and to protect human lives in the long term. In those cases, where the focus areas of compliance initiatives were found to be aligned with the regulated parties' interests, the adequate implementation of the efforts which had been made in this regard had proved to be the major challenge. In line with the identification of such a weakness, the proper implementation of post-settlement services should accompany the granting of awareness endorsement to the regulated parties concerned.
- **Stakeholder Liaison:** The Regulator was found to assume that the establishment of meetings for attendance by various technical and non-technical stakeholders helped to ease over most of the communication problems which had previously been experienced. However, the regulated parties concerned indicated that established meetings with the Regulator was only the first step to be taken towards the discussion of critical issues of understanding the Building Regulations. Up until that point, most of the deliberations undertaken in meetings or consultative forums had been prescriptive in nature, with details of progress, made in terms of compliance to building Regulations, seldom having been shared. Certain ideas, such as those relating to the compliance benefits, which were thought to be good, had, when put into action, been poorly



communicated and executed. *Open* communication, accordingly, clearly does not guarantee *effective* communication, of which the responses by other pall participants to the study are proof.

- **Ensuring uniform understanding and implementation of the legislative mandate:**  
The Regulator clearly realised that they needed to educate the regulated parties on matters relating to National Building Regulations and its regulatory processes and systems. They expected the government, the Department of Trade and Industry as the Principal custodian of the legal mandate, to play a directorship role in ensuring the enforceability and compliance of the Building Regulations, by beginning to review the legislation in order to address the changes, developments and challenges faced by the built-environment and/ or building industry as well as to introduce sanction directives, in a form of penalties, where non-compliance with the Building Regulation is identified.

*e) Analysis of the stakeholder relationships existing between concepts*

As is distinct from the four stakeholder categories, the current section considers the relationships between the categories and concepts concerned. It also explains that many of the concepts which were uncovered in the course of the present study, are related to the difficulties encountered in implementing building Regulations. The concepts concerned were split into two different categories, namely: (i) Policy, processes, systems and ineffectiveness; and (ii) the challenge of mind set change. As a government-driven regulatory -based policy, the prescriptions of Building Regulations were enacted for application by all stakeholders at all levels surveyed in the current research. However, the focus of Building Regulations, in addition to the principles contained in the Building *Codes of Good Practice* and Standards, lack the backing of adequate support mechanisms and rigorous monitoring systems, as the Codes concerned merely serve as a framework within which Building Regulations can be implemented. The ineffectiveness of such business processes and systems, as well as institutional arrangements, is manifested at the operational level in terms of the difficulties which have been encountered in changing the mind sets relating to the participation of the stakeholders concerned.

The implications of such difficulties of the Building Regulations' implementation process have led not only to the collapsing of buildings, but also, most importantly, to the mushrooming of

informal structures and disempowerment of building industry's economy, most of those South Africans at whom the policy is specifically targeted and is aimed at benefiting. The success of such projects depends on combining those elements which ensure the state of both being addressed and feeling of empowerment of the building industry. As a result, pro-activeness cannot necessarily be viewed as equivalent to successful implementation.

The participants concerned asserted that such shortcomings should be dealt with at both the policy planning and implementation levels. The respondents though remained convinced that only policy changes could ensure the achievement of both efficiency and effectiveness in implementation of the National Building Regulations' business processes and systems.

#### **4.5.2 Identification of strategies for managing gaps**

In the current study; the presence of management of gaps was considered both before and during the action research. Prior to the start of the action research, the respondents were asked how they thought the management of the perceptions and expectations of all parties involved might be achieved. In addition, during the action research, the respondents were presented with the gap results of the current study in terms of the impact the implementation of the Building Regulations have in their respective spectra, in relation to which they were asked to comment on, and to recommend specific strategies and solutions for the problems noted.

The theory coding which is recommended by Glaser (2007), in terms of an approach to data analysis, was used in the current study. The most noteworthy strategies, which were recommended by all those involved in the building regulatory initiatives surveyed, were sought out. The common pool of strategies is condensed as follows:

- **The offering of choice:** Regulation of buildings is about the offering of various choices and alternatives, followed by the ability and personal drive to ensure that buildings are healthy, safe and environmentally friendly for human occupancy within the realised goals of the legislative object. Other forms of regulatory compliance processes should be explored, which might help with establishing the principles of uniformity in the enforcement of the Building Regulations.
- **Communication:** The Regulator and regulated parties' relationship should be improved, so as to serve the interests of the regulated parties concerned in the best

possible way. The Regulator should also realise that the mere holding of additional meetings, e.g. Building Control Officer's Steering Committee Meetings, National Building Regulations Annual Conferences, and community Road Shows which were scheduled in the past, does not equate to success of implementation of the Regulations; rather, it is the level of satisfaction which is attained in relation to the issues discussed, and the conducive environment within which they are discussed which makes the difference. The details of the impact the implementation of the Building Regulations and its business processes and systems by the Regulator should be shared and debated, in order to manage the attitudes and perceptions about the effectiveness and efficiency of the Regulator, in ensuring that the objectives of its mandate are met. The perception that management understands the workers' problems, but does not take them into account, must be addressed by implementing the critical suggestions made by the regulated parties concerned and revise the Regulations accordingly, to address the changes occurring in all aspects of the building industry and its impact on ordinary citizens.

- ***Complementarities between tangibles and intangibles:*** Tangibles should not be treated differently from intangibles, as latter are the penultimate outcomes of the former. The two should complement each other with, for example, ensured structurally sound buildings (*tangibles*), complementing the directives issued and action taken when non-compliance to the Building Regulations is identified (*intangibles*).
- ***Development of a relevant information system:*** Information needs to be widely disseminated by the Regulator in the form of various media as a State-owned entity, at which the various issues which are at stake should be discussed, debated and consensus be reached without compromising the object of the relevant legislation. The generic strategies which are used for minimising any asymmetry in the available information and for managing any gaps existing between the Regulator and regulated parties should be focused on the development of a relevant information system. The development of such a building regulatory support system might help to create a culture of transparency, and self-regulations by regulated parties which should result in the following:

- ✓ The Regulator would effectively be able to communicate the building standards, regulations and best practices, as well as the understanding of regulatory processes and systems by the regulated parties/ industry.
- ✓ The regulated parties would be able to vent any feelings of discontent where deemed necessary. In addition to such a culture providing the Regulator with a space within which they can explain the regulatory business processes and systems, the regulated parties would also have a space within which to provide feedback and input which is supportive of effective compliance, as well as for exercising constitutional rights by building occupants and/ or owners and/ or their representatives.
- ✓ To accommodate the regulated parties' experiences, the Regulator would be encouraged, within such a culture, to improve on those areas which are most valued by the regulated parties concerned, e.g. Understanding sprawling of informal structures and what mechanisms can be put in place by the Regulator in ensuring the compliance to the Building Regulations.
- ✓ Open communication would be most likely to translate into effective communication.

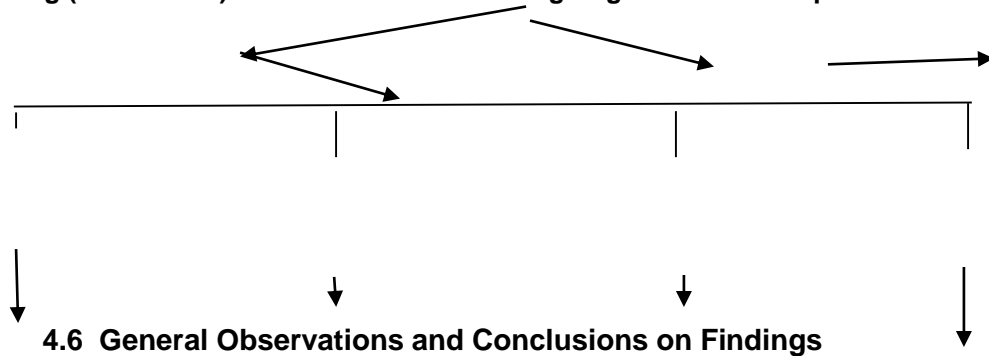
The acknowledgement of strategies of changes would thus result in the Regulators business processes and systems designs being re-engineered to include the strategies for managing gaps, as outlined in Figure 4.1 below.

Some of the participants of which formed the subject of the case studies in the current research had already begun to implement some of the recommendations made in this study at the time that the study was nearing completion, i.e. the Building Control Officer's Steering Committee was established as a stakeholder liaison platform between the local authorities (enforcer), the Regulator (administrator of the Building Regulations), and the government (custodian of the Act) where all other stakeholders take part on invitations. The purpose was to close the existing gaps and to strive to prevent future tensions arising from them.

The said motion indicates that the strategies developed to close any potential gaps are expected to curb or, at least, to minimise any disillusionment about the progress which has occurred in terms of the implementation of building regulations, processes, procedures, policies etc. was cautiously accepted, as the strategies discussed are bound to work for the entities concerned, provided that they are properly implemented by the Regulator for the

enforcement of the legislation by the local authorities, while the industry practitioners have the grounds to comply for the building owners and/ or occupants constitutional rights. The full impact of such changes is still awaited at the time at which the current dissertation was written.

**Figure 9 : Re-modelled NRCS' Building Regulations Conceptual Framework Source: Own study referencing (2013 - 2015) based on NRCS Building Regulations Conceptual Framework**



**4.6 General Observations and Conclusions on Findings**

A finding of the study is that the core business processes of the National Building Regulations of South Africa are inefficient and ineffectively implemented. The implication thereof is building failures, structural defects, collapsing of buildings, sprawling of informal structures and consequently endangered human life or deaths due adversity of implications.

Without progress, only change can occur, but not actual improvement. A regulatory instrument was established and tested in the current study. Four (4) categories of stakeholders at four (4) different levels affected by the implementation of the Building Regulations were reviewed. Due consideration must be given as to whether any general conclusions can be derived from the comprehensive review undertaken, over and above the raised level of understanding, which comes with the awareness of the concrete data which was gathered in the study. All the Building Regulations, business processes, and implementation strategies within the building industry, which were studied in the present research, had to do with all of those aspects which characterise the constitutional rights of the Building Regulations for ordinary citizens to have access to healthy, safe and environmentally friendly buildings suitable for human occupation.

Several misconceptions pertaining to the object of the Building Regulations and its legislative mandate require unpacking. Efficiency and effectiveness of implementation of the Building Regulations in each of the case studies, or group of case studies, should be regarded as a direct reflection of the government's intention and imperative to a basic service of safe, sound buildings for human occupancy. Regulated parties who are targeted in such regulatory processes are the portfolio of evidence of the government's success or failure in its empirical objectives. Only the case study, work arrangement, and stakeholder differences were found to be highly significant in the current study, resulting in the need for re-engineering of business processes and systems to address the strategic gaps.

#### **4.7 Results Summary**

Gaps and limitations on the implementation of National Building Regulations' business processes and systems were found to be present in the perceptions and expectations of the role-players concerned, as was expected at the start of the study. The existence of such gaps and limitations indicated two things: Firstly, it indicated that the self-regulatory mechanisms, which were already in place, might be addressing issues that are not aligned with the mandate of the government's objective to ensure that buildings are safe, healthy and environmentally friendly for human occupancy for all citizens. Secondly, it indicated that the existing business processes and systems do not meet the objectives of the existence, and also have limitations that result in the ineffectiveness and inefficiencies, of the Regulator at this stage of the study.

The existence of the gaps and limitation in the implementation of National Building Regulations in the built environment indicates four basic dimensions of the legislation: (i) Lack of awareness, knowledge and understanding; (ii) obsolescence; (iii) lack of regulatory powers for visible impact of the regulatory processes; and (iv) the need for improvement of regulatory business procedures, processes and systems. The presence of such dimensions can be seen to be sourced in the following: (i) The existence of unclear policy goals and approaches, ineffective support measures, and inadequate monitoring systems; (ii) the inefficient allocation of resources; and (iii) the commitment difficulties of the stakeholders concerned. The identified problems have resulted in difficulties with implementation, arguably forming the main impediment to the compliance process. As a result, the affected stakeholders, namely, building owners/ occupants and/ or their representatives, Building Control Officers, built-environment practitioners, and the Regulator have begun to feel discontented about the amount of progress which has been made in terms of the Building Regulator, thus beginning to nullify the trickle-down effect of the theorised relationship between implementation and the impact thereof. In order to attempt to solve such problems, the provision of different legal opinions, the opening up of more channels of communication, the establishment of complementarities, the assumption of common responsibility, the awareness programmes, and the creation of an information system are recommended based on the revised and approved Building Regulator's business processes and systems.

## **CHAPTER 5: CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

The previous Chapter was devoted to discussing the analysis of the data collected at the four levels of stakeholders and using the initial framework for analysis, as illustrated in Figure 9 of Chapter 2. The first level of analysis was from the perspective of prospective home owners/ home owners/ building occupants and/ or their representatives. The concept which was described in Chapter 2 was used as a tool to analyse and understand the process and interactions between home owners and the municipalities. The second level of analysis was from the perspective of professional practitioners and the municipalities as well as the Regulator. The third level of analysis used the perspective of the Building Control Officers and the professional practitioners, in line with the regulatory requirements. The fourth and final level drew from the perspective of the National Regulator for Compulsory Specifications as a Regulator of the built-environment and stakeholders at all three levels.

Given the outcome of the analysis of the results, the previous Chapter discussed the refinement of the initial framework for analysis of the results to a general framework. The latter emphasises on the need for a logical relationship between the stakeholders need analysis, policy framework and the approach needed to implement the framework using an information system. It ought to be mentioned that in Chapter 2, the uncertainties the South African government faces when seeking to implement legislation, was highlighted. Although legislation is in place, the existing framework has been ignored and/ or ineffectively implemented.



This Chapter, given the above, summarizes the first four Chapters, describes the contribution to body of knowledge made by this research, and makes recommendations from the outcome of the research.

Chapter One discussed how the building industry is being regulated in terms of the National Building Regulations and Building Standards Act 103 of 1977 (the Act), as the legal mandate and the role of the National Regulator for Compulsory Specifications in administering the said Act as the Regulator to ensure that buildings are safe, healthy, meet environmental requirements, and are suitable for human occupancy. It further highlighted that despite the existence of the regulatory mandate in the form of the Act and the Regulator being in place, buildings still collapsed resulting in numerous complaints, disasters and deaths. The latter had thus confirmed the problem statement that there were gaps in the regulatory processes.

Chapter Two, in providing insight into studies conducted and relevant work done around the Regulations of buildings within the built environment, showed that there are various stakeholders ranging from the building occupants, built–environment practitioners, to regulators of the building industry who were not aware of the importance of Building Regulations; hence little had been done to revise the Building Regulations, its regulatory business processes and to ensure its effectiveness by and to all affected stakeholders. The latter aimed at addressing the problem statement and ensuring that buildings no longer collapse due to failure of regulatory business processes.

Chapter Three described the research philosophy and strategy which led to the design and data collection. To obtain data, sampling of 10 individuals per stakeholder group was interviewed as follows:

- 10 x homeowners as stakeholder level 1;
- 10 x Built environment professional practitioners as stakeholder level 2;
- 10 x Building Control Officers at stakeholder level 3; and
- 10 X NRCS Staff members at various post levels as stakeholder 4.

Based on a standard questionnaire relevant to each stakeholder level, one-on-one interviews were conducted with the Regulator's officials, and the questionnaire was circulated to Building Control Officers during a stakeholder forum, i.e. Quarterly BCO Steering Committee Meeting. In an open industry convention, namely the BCO Convention 2014, general homeowners and professional practitioners were randomly selected and interviewed in accordance with the

questionnaire. The approach covered the entire population of affected stakeholders and equal sampling for consistency of analysis and results.

This, as explained in Chapter Four, showed that there was fragmentation in the awareness and understanding of the importance of the Building Regulations through the regulatory business processes, to ensure that citizens occupy safe and healthy buildings that meet environmental requirements and are suitable for human occupancy. The research methodology used in collating data from various stakeholders, as mentioned above, was useful for interpreting the gaps in the regulatory business processes to regulate the building industry, which in return had an impact on lives of the buildings' occupants and/ or owners.

Chapter Four further focused on the development of a framework of analysis and of a research plan for the current study. The finding that there was a gap in the regulatory business processes, resulting in lack of awareness and understanding of the importance of Building Regulations. The gap in the regulatory process was further proven to have resulted in the ineffective implementation of the Building Regulations and resulting inefficiencies.

## **5.2 Contributions of the Research**

The current study analysed the governance of the building industry, in terms of the relevant laws, gaps and impacts. It is against this statement to deduce that the study will thus make a sound contribution to the development of both current and future knowledge of regulations and regulatory processes within the built environment in three different ways: (i) In terms of theory, (ii) in terms of methodology, and (iii) in terms of practice.

### **5.2.1 Theoretical Contribution**

Building Regulations in Southern Africa have been described as both an instrument for, and a measure of compliance to building standards and practices through regulatory procedures Watermeyer and Milford (2004). They were also outlined as a failure to compliance measures where buildings were reported to have collapsed, for instance the Tongaat Mall Collapse, foreman pleading ignorance of the Building Regulations Barbeau (2014).

The contradictory perspectives granted by the various stakeholders affected from the beneficiary, end-user, developmental, economics and socio-economics, all converge in their perspective ways to argue either for or against the effectiveness of implementation of the Building Regulations' regulatory business processes, its impact and the need to redesign the

core business processes. Therefore, rather than the current Regulations' assessment being solely on the findings which have resulted from the application of the objective measures, subjective measures were used to quantify the degree of impact of the Act, in order to gain an understanding of the experience and role of each stakeholder at every level concerned, as well as the institutional context within which they work, in administering the Regulations Watermeyer and Milford (2004) through regulatory business processes within the building industry.

The gaps in processes, as discussed in the online regulations and implications Bouzidi (2012), information systems modeling process and legislation Madsen (2012), contemporary issues on business information systems Sommerville (2011), and re-engineering of Nepal Rastra Bank Atreya (2012) have been blamed for the failure to comply with Building Regulations. A review of the building regulatory framework, regarding the safety of buildings and the governance thereof, was therefore found to be imperative.

### **5.2.2 Methodological Contribution**

In the current research, the study around the implementation of regulatory business processes in terms of the Building Regulations and their governance in terms of the Act has been pursued by means of engagement of all affected stakeholders at various stakeholder levels. The qualitative approach, with the use of interviews, helped to collect the type of data which led to the understanding and the uniformity of the Act through regulatory processes served to reinforce the results of the investigation Baxter and Jack (2009). The present research process delivers a general framework which allows researchers and practitioners within the built-environment to explain and to evaluate the structural and procedural changes which are associated with enacted health, safety and environmental requirements of the buildings for human occupancy.

### **5.2.3 Practical Contribution**

The current study has contributed, and continues to contribute to, reviewing of the legislature, i.e. the Act, and its Building Regulations, as a regulatory mandate and as a result, re-designing the core building regulatory business processes. The review will have an impact on all affected stakeholders at all levels. The essence of the study entailed identifying means of ensuring that buildings are safe, healthy, meet the environmental requirements, and are of sound quality for human occupancy through legislative compliance initiatives.

However, what is more challenging in terms of regulatory processes, is the understanding and uniformity in the implementation of Building Regulations in a way that is responsive to the needs of all affected stakeholders regardless of whether a stakeholder is an end-user, administrator of the legislator, or the enforcer. Such distributions can be achieved by focusing on the operational procedures as influenced by the Act and the Regulations in a bottom down approach. The approach will assist in bringing about the clear understanding to all stakeholders of roles, responsibilities, accountabilities and the impact of redesigning the core regulatory business process of the National Building Regulations of South Africa and how the process will be managed.

### **5.3 Recommendation**

In general, the respondents, at all stakeholder levels, in the current study expressed the feeling that the National Building Regulations and building standards within the built environment face major challenges and obstacles. The general lessons learned from the analysis conducted as part of the current study can be seen in items of the following key points, which are all of significance to the future of safe, healthy, environmentally friendly buildings of sound quality for human occupancy:

- [a] Stakeholder consultations in the core regulatory business processes' development and/ or redesigning in line with the relevant building regulations;
- [b] Stakeholder awareness forming part of the core regulatory business process for all affected stakeholders at all levels;
- [c] Lack of uniformity in understanding, interpretation and implementation of the building regulations and its core regulatory processes;
- [d] Lack of awareness and understanding of the regulatory framework in line with the Act; and
- [e] Inadequate support measures and lack of robust monitoring tools, which led to the lack of commitment to the effective implementation of the Regulations by the regulators and enforcers of the Act; this being due to the lack of clarity regarding the objective of the legislative mandate.

When all the above factors are combined difficulties in the implementation of the core regulatory business processes results.

## **5.4 Limitations**

Limitations of the current study are categorized and discussed as follows:

### **5.4.1 Conceptual and theoretical limitations**

The term “National Building Regulations” has been used ambiguously in the past. Due to lack of clarity about its nature, the definition, conceptualization, theorization, and practical application of building regulations and other applicable standards of practice have been questioned, revised and expanded on. It has, therefore, been difficult to reach any consensus about the effectiveness of the Building Regulations business processes and the efficiency of regulations in South Africa.

### **5.4.2 Methodological Limitations**

The comparison of the objective and subjective dimensions of Building Regulations, in relation to both perceptions and expectations, comprises an evident diagnostic analysis. The current study has therefore been able to identify existing gaps as an indication of regulatory, procedural, process and general awareness problems, rather than having definitive implications. However, to minimize the impact of such a flaw, as outlined in the current study, key points coding was applied Allan (2003); Graneheim et al (2004); Hsieh et al (2005) Elo and Kynge (2008); Elo and Kääriäinen et al (2014) in regards to the content analysis through interviews of all relevant stakeholders. Respondents’ views were thus compared with descriptive problem statements.

In the case studies explored through questionnaires, caution was exercised when interpreting the findings in that some of the affected stakeholders were not balancing their subjectivity in expectations to the objectivity of the subject of safe buildings in South Africa through effective regulatory business processes.

Irrespective of such limitations, it is envisaged that the current study will stimulate further discussions of the research into the value and effectiveness of the Building Regulations and efficiency of its regulatory business processes.

### **5.4.3 Policy Limitations**

During the period of the current study, the understanding, interpretation and implementation of the Building Regulations was still vague and the custodian of the legislation, the Department of Trade and Industry, had just commenced with the review process of the Act. The process

is anticipated to be completed within a period of 5 years from the period of current study. By implication, there is still adequate room for independent scientific researches and affected stakeholders to make an assessment of errors.

### **5.5 Future Research**

With the limited and insufficient studies conducted around the National Building Regulations and the implementation of the core regulatory business processes, it can be concluded from both Laubscher (2011) and Watermeyer (2010:6) that the future debate should focus on redesigning regulatory business processes for uniformity in understanding, interpretation and implementation of the legislation, i.e. the Act, to ensure that buildings are healthy, safe, meet environmental requirements and are of sound quality for human occupancy. Future research developments should further focus on:

- [a] Inclusion of stakeholder consultations and awareness as a sub-process in the re-designed processes;
- [b] Clearly re-defining the roles, responsibilities and accountability of all affected stakeholders, including the end-user's benefactor in the administrative Charter where the legislation may not be promptly amended;
- [c] Analysing the Regulations, regulatory framework and business processes;
- [d] Evaluating the effectiveness of the role which the Building Regulations, and its business processes, can play in ensuring the safety of building occupants, preventing collapsing of buildings and defective buildings;
- [e] Analysing the dynamics underlying the strategic repositioning of stakeholders at all levels within the built-environment, as a result of Building Regulations and effective implementation of its core business processes; and
- [f] Broadening the application of the core regulatory business processes by analysing other regulated environments, e.g. the Electrotechnical Industry, while remaining mindful that the simple adaptation of the redesigned core business processes within the built environment is to address the problem effectively.

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