KEY COMPLIANCE FACTORS OF SPATIAL REQUIREMENTS FOR NEW BUILD HOMES IN ENGLAND

by

Adedotun Ojo

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ABSTRACT

The English housing industry currently faces a recurrent housing crisis, where there is a rising demand for New Build Homes (NBHs). The consequence of this has placed additional pressures on planning authorities, developers, clients, investors, and end-users of Space, which is one of the most important elements of building design to define the requirements and functions of a building. The 2016 Housing Standards Review was designed to streamline and simplify the planning process for creating quality of space performance and sustainable housing. Unfortunately, however, it appears to have caused a lot of confusion and a low rate of compliance with Housing Space Standards (HSS) for NBHs in England. This research aims to evaluate the key compliance factors influencing the compliance with HSS by planning authorities, developers, and housing associations/landlords across England. A set of hypotheses were proposed to investigate the relationship between the compliance factors and spatial quality of NBHs in England.

A mixed methodology of Qualitative and Quantitative approaches was adopted to refine the compliance themes emanating from the literature review of compliance practices outside the English housing industry. The Qualitative methodology included the use of Thematic Analysis of HSS and Policy Frameworks, and a Thematic Analysis of a semi-structured interview questions of the compliance problem. The next phase of Quantitative methodology was employed, which involved carefully selected techniques for the identification of the most influential factors affecting compliance with HSS for NBHs in England. The Cronbach's alpha technique was used to validate the reliability of each compliance factor of variables, and the survey instrument itself. The Relative Importance Index technique was used to evaluate and rank the compliance factors. The top three compliance factors out of the 7 were found to be: (i.) *Strategic Objectives*, (ii.) *Responsibilities, Skills, & Expertise*, and (iii.) *Effective Collaboration & Stakeholder Adoption*. The other compliance factors in a ranking order are *Compliance Process & Technology Integration*, *Compliance Outcomes*, *Political Influence*, and *Market Influence*.

Finally, to test the initially proposed hypotheses, the One-way ANOVA technique was used to accept or reject hypotheses of the correlation between each of the compliance factors against the selected criterion variable – *Spatial Quality of NBHs in England*. Paradoxically, the findings showed that the most highly ranked compliance factor, *Strategic Objectives*, did not have a positive correlation with the criterion variable.

The key recommendation to the UK Government is to engender an effective all-stakeholder consensus on planning enforcement and space standards adoption, that will enhance a stricter regulation leading to a more vibrant housing market economy. The key recommendation to the LPAs is for an effective coordination of adoption and compliance with the NDSS requirements, the NPPF document should be applied in each local community to demonstrate local need as part of the Local Plan development for delivery of NBHs in England. The key recommendation to the Housing Associations and House Developers is to engage fully in an open, level-playing field of all stakeholders for the adoption of uniform space standards, as this has the potential of achieving better housing quality and increased certainty in housing delivery.

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LIST OF ACRONYMS

AEC	Architecture, Engineering, and Construction
BIM	Building Information Modelling
CAD	Computer Aided Design
DB	Design Bulletin
DCLG	Department of Communities and Local Governments
FM	Facilities Management
HMO	House in Multiple Occupation
HSS	Housing Space Standards
HSSS	Housing Space Standards Survey
IT	Information Technology
KPI	Key Performance Indicators
LP	Local Plan
LPA	Local Planning Authority
NAO	National Audit Office
NBHs	New Build Homes
NDSS	Nationally Described Space Standards
NHBC	National House Building Council
NIST	National Institute of Standards and Technology
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NWE	North West England
PFI	Private Finance Initiative
PM	Project Management
QS	Quantity Surveying
ROI	Return on Investment
UK	United Kingdom

CHAPTER 1
INTRODUCTION

1.1. BACKGROUND TO THE STUDY

The UK Architecture Engineering and Construction (AEC) industry currently faces a recurrent housing crisis. There is a rising demand for new homes and social housing; the consequence of which has placed additional pressures on funders, developers, clients, and end-users (Carmona, *et al.*, 2003). The housebuilding (residential) sector, like most sectors of the AEC industry, is highly fragmented with a great number of small to medium-sized enterprises (Lathan, 1994; Egan, 1998). Carmona (2001) attested to the accuracy of this claim that the housing sector has continually been criticised for its failure to innovate, which is evidently a direct consequence of planning constraints.

The National Planning Policy Framework (NPPF), published by the UK Department of Communities and Local Government (DCLG), stipulates that housing development should take account of current and future demographic trends, market expectations and the needs of a wide range of people, including families with children, older people, and disabled people (DCLG, 2013). The Government's Housing Standards Update (published in March 2015) has led to a significant reorganisation of codes, standards, rules, regulations, and guidance applied by such bodies as local authorities for new housing developments (DCLG, 2017). The underlying problems of the wider AEC sector are high levels of fragmentation, project complexity, information granularity, ontology, conformity. These challenges impede the construction processes, communication, design, time, money, and quality. The industry is designed around rules to enhance our safety and well-being, stressing that a building is controlled by numerous compliance evaluations throughout its life cycle. During the design process, architects and engineers make certain that every element of their design adheres to the regulatory requirements, which is then subject to the approval of the regulatory authority (Succar, 2009; Dimyadi and Amor, 2013).

The conventional practice of compliance checking across the AEC industry has predominantly been a manual process in the UK (Dimyadi and Amor, 2013). According to Luo and Gong (2015), manual code compliance is a mechanical work with a huge workload, which is

strenuous, time-consuming, and prone to many errors; the reason for the sluggishness in practical work, such that Wix (2008) earlier reported that 85 per cent of Architects and Engineers are keenly interested in automated compliance checking since they utilise over 50 hours to evaluate several design models, ensuring that they meet the requirements stipulated by the functional, structural, engineering, aesthetic, and environmental criteria of a new building (Wix, 2008). Manual compliance checking in pertinent sectors of the AEC industry such as safety management checking processes (Zhang *et al.*, 2013), (Park and Kim, 2015); quality inspection and control in construction (Boukamp and Akinci, 2007); design of building envelope (Boukamp and Akinci, 2007) etc., have problems of efficiency and precision.

At the higher end of the housing market, some of the larger housebuilders, clients, investors, and housing stakeholders use collaborative platforms especially for their mega-sized construction projects; which often involve infrastructural works, and requiring organisation and management of other non-housing aspects, namely – retail, commercial, landscaping, office buildings, healthcare facilities, high-rise buildings, civil works, etc., as mentioned above (Wilkinson, 2016).

1.2. STATEMENT OF THE PROBLEM

England faces a growing housing demand with an increasing population living alone relative to previous decades and others getting married later in life; one-individual households are projected to increase by 68,000 per year, that is, 33 per cent of the combined increase in households up till 2039 (Gallent and Tewdwr-Jones, 2006; DCLG, 2016). England is in great need of more homes, CBI (2014) reiterated, and the need is set to worsen over the coming decade. The pressures of population growth and the fact that life expectancy of the ageing population is improving, will aggravate the situation (CBI, 2014). Other constraints impinging on the English housing sector are *land shortages, regulation, self-builders, competition from overseas firms,* etc. The second greatest concern of developers is attributable to *regulation,* such that inspections of developers' conformance to building regulations and other standards were considered as sometimes being slow and disorderly; suggestions were made to speed up and improve the process (CLG, 2010).

In addition, in a research carried out by Lloyds Bank Research Series, it was reported that many participants complained about the slow processing of the Planning Application System, with 46 per cent of respondents attributing this as a factor influencing the housing shortage in

England (Lloyds Bank, 2015). Regulations (standards, codes, rules, and regulatory requirements) raise the cost of housing provision; require certain actions, while excluding others; increase response times; create uncertainties, bottlenecks, and risks; and the impacts depend on the way regulations are implemented. The justification for having regulations in the first place is that the benefits still outweigh the costs associated to them (CLG, 2010).

Studies have been undertaken on various compliance approaches in various building design requirements, ranging from building envelope design (Tan *et al.*, 2010), energy codes (Cheng and Das, 2014), fire codes (Choi *et al.*, 2012) , safety codes (Park and Kim, 2015; Zhang *et al.*, 2013), structural codes (Nawari, 2011), construction specifications (Boukamp & Akinci, 2007), to deep foundations (Luo and Gong, 2015), etc.; but none yet on the checking of spatial requirements for New Build Homes in England.

The following are some of the issues experienced with the traditional compliance approach according to Construction (2007): 85% of Architects are dissatisfied with manual compliance checking, hence interested in an improved compliance approach; Difficulty in evaluating building designs as Clients modify things often, and then the Architects have to respond promptly to the changes; Architects on average spend almost 50 hours per project on compliance checking with 11% spending over 100 hours; 50 hours per discipline (architect, structural, MEP, contractor) – a total of 200 hours devoted to compliance checking; 25 to 30 hours spent on compliance checking at the minimum; 3-4% of design time is consumed by compliance checking; Up to 1/3 of entire time for some projects devoted to compliance checking; 2 – 5 months in calendar time devoted to compliance checking; 15 – 90 days to approve a commercial building permit.

This study, therefore, focuses on investigating the factors that affect the compliance of housing space standards for enhancing spatial *quality* of New Build Homes, which will lead to a positive trickle-down effect on new build housing delivery, increased profitability for the housing stakeholders, and enhanced client and end-user satisfaction. In a research paper set out to quantify the scale and extent of the space shortage in English houses, Morgan and Cruickshank (2014) demonstrated that a vast majority of new homes are below acceptable space standards. The paper evidenced that the UK has the smallest homes by floor area in Europe due to:

- The withdrawal of space standards in the 1980s;
- High value of land; and
- Low number of new homes being built. Without space standards, landlords, housebuilders and property investors, escape blame for providing inadequate space in their properties (Morgan and Cruickshank, 2014).

There are two major ways that housing standards are initiated and enforced:

- The Building Regulations, and
- The National and Local Planning Policy.

The Nationally Described Space Standards (NDSS) is yet to be incorporated into the Building Regulations; and the National Planning Policy Framework (NPPF) merely requires LPAs to identify the size, type, tenure, and housing typology that is required (Shelter, 2013). Existing policy frameworks such as the NDSS are merely an official statement of spatial requirements, which do not elaborate on the compliance factors that influence the adoption of spatial requirements for New Build Homes, and the compliance issues faced by housebuilding stakeholders in adhering to the space standard in England. Instead, the UK government maintains a hands-off approach, making the application of the NDSS optional for Local Planning Authorities (LPAs) to use in their local communities by justifying its application according to evidenced needs and viability testing (Peaker, 2014).

Furthermore, Surin (2016) identified a compliance gap in the housebuilding sector, highlighting that the constant construction debates and disputes is due to this gap, and that the requirement for a faster and more efficient adoption of compliance should be controlled for the end-users, and also give grounds for all project stakeholders to participate in effective collaboration and healthy market competition (Surin, 2016). There is an exigent need to bridge the regulatory compliance gap between the following identified below:

1. Spatial requirement
2. Spatial quality

These both have led to a reduction in corporate performance of stakeholders as evidenced by the following: Low or non-compliance with the housing space standards; Increased errors in

the compliance checking procedure; Slow planning application process for New Build Homes in England; Slow regulation and compliance checking procedure; Higher compliance checking and auditing costs; Short supply of decent, *spacious*, and quality New Build Homes in England; Reduced credibility and competitive advantage; Reduced financial performance and profitability.

Regulatory compliance checking is an activity performed primarily during the early design stages of a housing project, with an increasing complexity from the project brief to the detailed design stages. Many regulatory bodies and industry organisations are struggling to find the right approach of coordinating their compliance activities in order to maximise their corporate performance on housing delivery, and boost their competitive advantage (Dejaco, *et al*., 2016).

The Statement of the Problem can therefore be summarised as follows:

1. A vast majority of English New Build Homes are below acceptable space standards and smaller, compared to the rest of Continental Europe and the world;
2. There is a low rate of regulatory compliance of housing space standards for New Build Homes in England;

1.3. AIM AND OBJECTIVES

1.3.1. Aim of the Study

The overall aim of this research work is to identify the compliance factors influencing the adoption of housing space standards for New Build Homes; and provide recommendations for the planning and housing stakeholders in England.

1.3.2. Objectives of the Study

The overall aim is subdivided into five objectives:

Objective 1: To conduct an in-depth review examining existent literature as applied in the discussion about the compliance factors of housing space standards for New Build Homes in England;

Objective 2: To conduct a detailed analysis of policy documents and interviews in order to understand the factors influencing the compliance with housing space standards requirements in England;

Objective 3: To identify key factors that influence the regulation of housing space standards requirements for the English housing industry;

Objective 4: To test the association of the various factors influencing compliance with the housing space standards requirements in the English housing industry;

Objective 5: To provide recommendations to the stakeholders of the planning and housebuilding sectors of the English housing industry.

1.4. RESEARCH CONCEPT OF THE STUDY

The research concept builds on the statement of research problem earlier stated. The antecedent to a research concept is a research statement of the problem, which is usually in the form of a question (O'Dwyer and Bernauer (2013). Hence, the research concept is formulated in the form of a research question: *"What is the impact of 'Compliance Factors' on 'Spatial Quality' of New Build Homes in England?* Whereby, *Compliance Factors* are the independent variables, while *Spatial Quality* is the dependent variable. The *Compliance Factors* could be measured by the various variables of the proposed questionnaire survey; whereas, the *Spatial Quality* could be measured by the *High-Quality, Spatially Compliant New Build Homes* deliverable to the end-users.

1.5. RESEARCH HYPOTHESES FOR THE STUDY

According to Kumar (2014), a Null Hypothesis (H_0) is a hypothesis that the researcher *first* attempts to refute or nullify, while the Alternative Hypothesis (H_1) is the researcher's perception of the real cause behind a phenomenon. From the Research Concept stated above, the following hypothetical statements could be postulated in the form of a Null and Alternative hypotheses before the research study is embarked upon.

- **H_0:** There is no positive correlation or influence between Compliance Factors and Spatial Quality of NBHs in England;
- **H_1:** There is a positive correlation or influence between Compliance Factors and Spatial Quality of NBHs in England.

1.6. SCOPE OF THE STUDY

The UK has regional spatial requirements employed separately in Scotland, Wales and Northern Ireland. The context delimiter for this research covers England since the Nationally Described Space Standard (NDSS), adopted for the study is specifically for England. Also, English homes have smaller internal space (floor area) compared to Continental Europe and the rest of the world (Morgan and Cruickshank, 2014). Hence, for the purpose of this research, compliance for the English housing spatial requirements and specifications are addressed (Gov.UK, 2016).

Carmona, et al. (2003) highlighted, amongst several others, three key stakeholders of the UK housing industry. Hence, for the purpose of this research study on the planning and housebuilding sectors of the English housing industry, the key stakeholders are:

- Local Planning Authority (The Regulator of Compliance Activities);
- Housing Associations (The Buyer of Housebuilding Services);
- House Developers (The Seller of Housebuilding Services),

1.7. STRUCTURE OF THE THESIS

The thesis will comprise 6 chapters. The contents of each chapter are summarised as follows:

Chapter 1 provides a general introduction of the thesis detailing the nature of the research study investigated, focussed on the definition of the compliance problem. It contains justification for selecting the topic and rationale for addressing the research problem. The chapter includes an overall aim and objectives, and an outline of the stages that constitute the research process.

Chapter 2 provides a review of available literature on the broad issues of regulatory compliance. It presents the understanding of compliance terminologies pertinent to the housing industry. It also presents a review of plausible compliance factors imported from other industries for adoption in the housing industry. This chapter addresses *Objective 1* of the research study.

Chapter 3 provides a critical review and thematic analysis of existing housing space standards and policy frameworks utilised in the housebuilding sector, which proposes a set of compliance

codes and categories for the development of themes for regulatory compliance of spatial requirements for New Build Homes in England. This chapter addresses the first phase of *Objective 2* of the research study.

Chapter 4 expatiates on the research design, the research paradigms and philosophical positionings, and the rationale for the selection of the most suitable methodology for the research study. It also addresses the research methodology and techniques used for collecting data for the research study. The research methodology section details the steps and strategies adopted for data collection and subsequent analysis for the achievement of the overall aim and objectives for the study. A research flowchart illustrating the research design from the problem statement, to the aim and objectives, to the development of the compliance chart for the New Build Homes in England is presented. This chapter addresses the second phase of *Objective 2* of the research study.

Chapter 5 presents the results of the questionnaire survey study of the investigation of the key compliance factors influencing the adoption of housing space standards for New Build Homes in England.

Chapter 6 presents the discussion of findings of the questionnaire survey and the entire research study. There is a demonstrable triangulation of data findings between the secondary data of general literature review and analysis of housing space standards, and the primary data of integrated qualitative findings and quantitative questionnaire survey findings.

Chapter 7 presents the conclusions drawn from each objective of the study, and limitations to the study. Recommendations are made for further studies

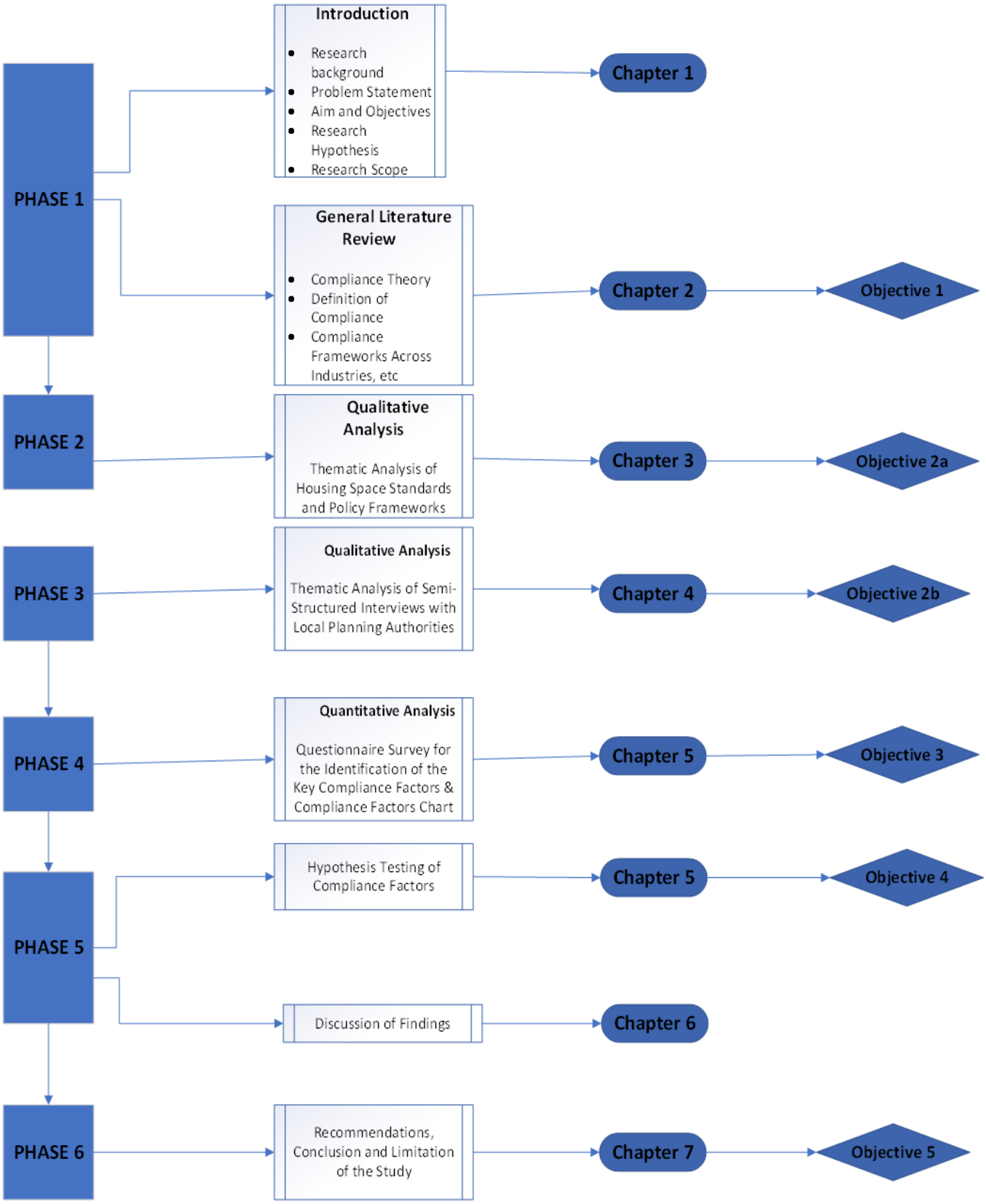


Fig.1.1: Research Process Showing Structure of Thesis

CHAPTER 2

A REVIEW OF COMPLIANCE PRACTICES FOR THE ENGLISH HOUSING INDUSTRY

2.1. INTRODUCTION

It is imperative to provide understanding of the basic compliance terminologies that apply to the housing sector of the construction industry. Such terminologies discussed in this chapter include, Compliance, Regulatory Compliance, Compliance Theory (which serves as a theoretical underpinning for the Compliance Factors of housing space standards in England), and Compliance Frameworks. Compliance Frameworks from across other industries were examined, and the compliance factors influencing them were reviewed. The outcome of this phase is a Literature Review Chart of Spatial Compliance Factors. The Compliance concept of spatial requirements was delved into for the English housing industry. Justifications are presented for the need for the adoption of the new space standards (NDSS), and New Build Homes in England.

2.2. THEORETICAL UNDERPINNING OF COMPLIANCE FOR THE HOUSING INDUSTRY

2.2.1. The Compliance Theory

Compliance and non-compliance are intricate human behaviours. The causes of these behaviours are numerous, thus harmonising them into a meaningful whole is not easily achievable (Suchman, 1997; Mitchell 1996). Some of these behaviours are “automatic” compliance or non-compliance, which are a product of habits, routines or automated systems. On the contrary, other behaviours can be classed as “planned” compliance or non-compliance, which embodies the deliberate pursuit of diverse goals, such as to maximise benefit, fulfil a moral duty, or to dispose of the fear of penalty for non-compliance (Brehm and Hamilton, 1996). In order to resolve this complication, compliance theorists typically give emphasis to the *planned* behaviour of compliance rather than the *automatic* behaviour; concerned with achieving a particular goal or objective as a satisfactory estimation of actual processes of action (Etienne, 2011). This, Etienne posits, has led to several insightful analyses.

First, according to Fisman and Miguel (2007), *compliance theory* should furnish a logical and consistent account for stakeholders' tendency to pursue several heterogeneous goals at the same time. Empirical research has demonstrated that there is an interaction of material, emotional and normative goals in any compliance or non-compliance behaviour (Parker, 2006). For example, a given housing stakeholder may be aspiring to maximise profit, safeguard itself against a hazard, and act appropriately, all at the same time. The individual influences of each of these goals on stakeholder behaviour is not easily quantifiable with a common standard (Etienne, 2011). Profit-making or maximisation depends on costs and benefits optimisation, which is consequential; however, acting appropriately is not consequential, but rather it depends on the congruence of available options with internalised or acceptable norms. Thus, satisfaction of these varied motivations hinges on the criteria of *consequences* and *appropriateness,* which are not equivalent or proportionate to one another (Etienne, 2011). Diverse ideas have been proposed to tackle this "plurality of motivations", of which the most prevalent response by compliance theorists has been to merge a handful of different models of action (Etienne, 2011). Ayres and Braithwaite (1992) combines two conflicting ideas – the idea that choice is informed by a cost-benefit calculus, and the idea that stakeholders may adhere to internalised moral norms. According to Mitchell (2007), this concession between the lines of reasoning of *consequences* and *appropriateness* is typical of many contributions to the knowledge of regulatory compliance.

Second, compliance theorists are confronted by the fact that the various stakeholders' heterogeneous motivations influencing compliance or non-compliance are not necessarily cumulative influences on the evaluation of their options. Rather, research indicates that these heterogeneous motivations interplay in other ways, counteracting one another (Peltzman, 1975; Frey, 1997), thus leading to more questions about compliance being unanswered. The frustration of successfully addressing the issues of *plurality* and *heterogeneity* of stakeholder goals and motives for compliance has hampered capacity to effectively describe changes in compliance over time, hence understanding these dynamics of compliance behaviours is critical to overcoming the existing set of stakeholder goals and motivations (Gray and Scholz, 1993).

Therefore, the application of the *Compliance Theory* provides the foundational knowledge that there are conflicting compliance goals practised by respective planning and housing stakeholders. The understanding of this underpinning theory aids the empirical investigation of

the underlying factors influencing the compliance behaviours of the planning and housing stakeholders, hence uncovering the plurality and heterogeneity of goals, objectives and motivations of these stakeholders, and helping to resolve the problem of regulatory compliance of housing space standards for New Build Homes in England.

2.2.2. Definition of Compliance

The simplest definition of *Compliance* is "to be in line with the laws" (BVR et al, 2002). *Compliance* is, however, perceived to mean the organisational actions taken to ensure provision of general adherence to laws, rules and regulations (Burkle, 2005; Knuplesch, et al., 2017). In modern times, the obligations for organisations to adhere to regulatory authorities have increased, thus demanding that organisations fulfil certain technical requirements, in addition to developing compliance processes and functions to support those requirements and outcomes (SIA, 2005).

PwC (2005) defines *Compliance* in a broader scope as "the organisational model, processes and systems used to ensure adherence with laws and regulations, internal standards and policies, and expectations of key stakeholders considering for example its customers, employees, suppliers, investors, auditors, and regulators so the enterprise can protect and enhance its business model, reputation, and financial condition.

According to STANDS4 (2019), *Compliance* means conformance to a rule such as a specification, policy, standard or law. *Regulatory Compliance* is used to describe the goal that organisations aim to attain in an effort to build awareness into staff and create steps to comply with pertinent laws and regulations (STANDS4, 2019; Absolute, 2019; PowerDMS, 2019). TechTarget (2019a) defines *Compliance* as "either a state of being in accordance with established guidelines or specifications, or the process of becoming so." It also encompasses concerted efforts to make sure that corporate organisations are adhering to industry regulations and government legislations due to the proliferation of regulations that mandate organisations to be keen on upholding a fine grasp of their regulatory compliance requirements (TechTarget, 2019a). In a similar vein, TechTarget (2019b) defines *Regulatory Compliance* as an organisation's adherence to laws, regulations, guidelines, and specifications pertinent to its business processes. *Regulatory Compliance*, however, should not be mistaken with *Corporate Compliance* or *Internal Compliance* as the instruction between an external or internal directive might vary considerably (Absolute, 2019). *Regulatory Compliance*, which means adhering to

external legislations established by local, regional, central, and international governments, is quite different from *Corporate Compliance*, which stipulates adhering to internal policies, rules and regulations within an organisation. Incidentally, both are crucial in fostering integrity, safety, ethical and acceptable behaviour, accountability in the workplace, and healthy competition in the marketplace (Absolute, 2019; PowerDMS, 2019).

2.2.3. Definition of a Compliance Framework

TechTarget (2019c) defines *Compliance Framework* as a structured set of guidelines detailing an organisation's processes for maintaining adherence to established legislation, regulations or specifications. More so, a *Compliance Framework* illustrates the regulatory compliance standards applicable to an organisation and processes and internal controls the organisation deploys to adhere to the standards in question. Hence, a Compliance Framework assists organisations to set up, and administer best practices to attain corporate compliance (TechTarget, 2019c).

2.2.4. Compliance Frameworks Across Industries and Countries

Ample best practices and research conducted in the corporate world of financial, insurance, healthcare, IT, regulatory, non-profit organisations, etc., has shown that many compliance frameworks exist in practice outside the housing and AEC industries. *Compliance Frameworks* also vary by country, hence multinational corporations must be aware of the compliance framework rules of each country they trade in. For instance, the European Union's General Data Protection Regulation (GDPR) that was enacted in May 2018 relates to all data generated by EU citizens irrespective of whether the operating company gathering the data is domiciled in the EU or not. GDPR apparently also applies to people living outside the EU, whose data are stored within the EU, whether they are EU citizens or not (TechTarget, 2019b).

In the United States, the *Sarbanes-Oxley Act (SOX) of 2002* legislation (like the German *Deutscher Corporate Governance Kodex* and the Australian *Corporate Law Economic Reform Program Act 2004*) was established to supervise corporate fraud from a financial standpoint. Aside safeguarding whistle-blowers, the SOX prohibited chief executives from taking loans, and holding them accountable for any financial impropriety (Absolute, 2019). The *Dodd-Frank Wall Street Reform and Consumer Protection Act* is a US federal legislation that was enacted in 2010 to regulate financial markets and protect consumers against a repeat of the 2008 global financial crisis. Another prominent example of compliance framework is the *Health Insurance*

Portability and Accountability Act (HIPAA) promulgated in 1996 to publicise standards for electronic exchange, privacy, and security of health information of patients and customers, which must be incorporated into the business processes of healthcare organisations, and strictly adhered to (Absolute, 2019).

Furthermore, other compliance frameworks include: *Payment Card Industry Data Security Standard* (PCI DSS), *Federal Information Security Management Act* (FISMA), *Governance, Risk and Compliance* (GRC), *Enterprise Risk Management* (ERM), *Open Compliance & Ethics Group* (OCEG) framework, *Compliance Oriented Architecture* (COA) framework, *Control Objectives for Information and Related Technology* (COBIT) framework, Fifteen P – Compliance Model, to name a few (See Tab.2.1) (Jinnett, 2004; Menzies, 2006; Quinn, 2006; Pupke, 2008; Compliance Experts, 2016, TechTarget, 2019b).

One of the most recently awarded professional services framework particularly for the UK AEC industry is the *Scape Framework*, initiated by a consortium of construction organisations and framework partners namely: Pick Everard (responsible for the delivery of PM & QS services), Carillion (for the delivery of FM services), Faith+Gould (for the provision of Asset Management, Surveying, Design services), Balfour Beatty (for the execution of Civil Engineering & Infrastructure services), Wilmott Dixon (for the construction of Major Works) and Kier (for the construction of Minor Works) (Scape Group, 2016a). The Scape Framework has a unique approach to supporting clients, ensuring the provision of a managed framework service and collaboration for client satisfaction and the realisation of benefits for the end-user (Scape Group, 2016a); even though there are no evidenced compliance factors to illustrate as in the table below. In addition, the *East Midlands Property Alliance (EMPA)* approach was established by a consortium of local authorities in East Midlands to enhance the delivery of property services to their communities via effective collaboration and information sharing (Scape Group, 2016b; Underwood, et al. 2017). These compliance frameworks tend to provide their own set of services, compliance methodologies, Key Performance Indicators (KPI) monitoring, client support and satisfaction (Pupke, 2008).

According to PwC (2019), corporate organisations across all industries are steering their way through a worldwide build-up of various regulatory requirements, stakeholders' expectations, client satisfaction, and changes in business models. Organisations are increasingly being confronted to have to comply with laws and regulations, while they need to optimise their

brands, enhance shareholder value, and maximise profit. These issues are found to be more severe in highly regulated industries such as healthcare, life sciences, and financial services than other industries. However, no matter the industry type or organisation size, all companies must comply with specific laws and regulations as part of their business operations (PowerDMS, 2019). Hence, *Compliance* is not only for the healthcare or financial services, but also for the construction and housing industries. However, the *Compliance* agenda has morphed from mere *compliance* to more strategic compliance approaches and outcomes such as the following:

- Prediction of the effect of relevant regulations on strategic objectives, business model, and compliance management processes;
- Determination of the most suited compliance roles and responsibilities between compliance, legal, and business functions;
- Instilling compliance culture change across borders, functions, and teams;
- Evaluation of compliance value and management of performance expectations of stakeholders;
- Crisis management and redress in more complex project environments;
- Development of consolidated compliance capacity of forecasting global trends, increasing organisational efficiency, and contributing to the organisation's core strategies.

Pupke's detailed narrative and thematic analysis of various compliance frameworks and approaches helped to uncover elements of compliance coordinating mechanisms embedded within the frameworks, which were later utilised to critically understand and empirically investigate the compliance coordination problem in the financial services sector. Pupke's overall research goal was to understand the impact of the compliance mechanisms on corporate performance of companies. Therefore, as illustrated in the tables below, the compliance coordinating mechanisms common to these Compliance Frameworks based on Pupke's analysis are:

- Compliance Strategy
- Compliance Responsibilities
- Compliance Collaboration
- Compliance Technology

- Compliance Value

Pupke (2008) presented a fair narrative and thematic analysis for each compliance framework listed ranging from legally driven, IT-driven, to general compliance frameworks or approaches. For the Health Insurance Portability and Accountability Act of 1996 (HIPAA), which was enacted by the US Congress, Pupke provided a detailed narrative of the following sections:

- Regulatory basis and origin of the framework;
- Objectives of the framework;
- Elements of the framework;
- Summary of the framework.

The last section titled *Summary of the framework* provides a summarised version of key elements required to coordinate the compliance process in a healthcare delivery setting. Although, the process of how categories emerged was not explicitly spelt out, the author must have internalised and applied a unique blend of thematic coding techniques to arrive at the categories. This is represented in a tabular format below.

Tab.2.1: Example of Pupke's Thematic Analysis of Selected Compliance Framework

Elements of HIPPA Framework by NIST	Explanation of Component	Category and Rationale Behind It
Security Management Process	This component of the framework identifies key risks and vulnerabilities for security, which are used to develop policies and procedures.	**Category:** Strategy **Rationale:** Pupke would have settled for *Strategy* because of the emphasis on using the key risks and vulnerabilities for policy development and procedures.
Assigned Security Responsibility	In addition to an existing committee, this framework component assigns a dedicated role to an individual whose task would be to oversee and chair the committee to develop the policies and procedures.	**Category:** Responsibility **Rationale:** The author would have chosen this because of the specific role and task assigned to the specific individual.
Security Awareness and Training	An appropriate training programme needs to be designed for the organisation in question; followed by an assessment to determine which	**Category:** Communication **Rationale:** It appears that the author selected this category to buttress the level of

	training modules the organisation; creating awareness of the programme within the organisation; programme design, training assessment, programme design, training execution, and training post-evaluation exercise to know if the process was reasonable and fit for purpose.	communication and information exchanges that exist in the component to make compliance possible.
Security Incident Procedures	This component of the framework designs an emergency plan to be used during significant occurrences to mitigate negative consequences.	**Category:** Strategy **Rationale:** The author would have chosen this because of the strong possibility of building the security emergency plan into the policy development process.
Contingency Plan	This component of the framework is a risk-assessment and action-planning procedure for mitigating potential hazards that could cause non-compliance behaviours and incidents.	**Category:** Strategy **Rationale:** The author would have chosen this because of the high likelihood of including the hazard-prevention mechanism as a business continuity plan, and as an aspect of the strategic policy development process.
Evaluation	This framework component has a technology-enabled or automated monitoring function to determine the current level of compliance. Such monitoring techniques include IT-enabled interviews, surveys, and outputs from automated tools.	**Category:** Technology **Rationale:** Clearly, it is easy to see why the author has assigned elements of technology-enabled and automated functions under the Technology category, so as to enhance compliance checking and procedures.

Tab.2.2: Elements of Existing Compliance Frameworks from Other Industries

Title of Compliance Framework	Compliance Framework Elements (Sub-elements of compliance coordinating mechanisms extracted from a narrative and thematic analysis of the frameworks)	Categorised Elements of the Compliance Frameworks				
		Strategy	Responsibilities	Communication	Technology	Value
Legally Driven Compliance Frameworks						
WpHG ~35 (A German Compliance Organisation for managing IT system risks, BVR et al., 2002)	• Self-assessment (S) • Basic concept (S) • Advanced concept (C) • Compliance function (R)	2X	X	X		
HADDEX (Handbook for German Export Controls, with the objective of avoiding the penalties & the other negative outcomes of non-compliance, Puschke, 2005)	• Function (R) • Organisation (R) • Recruiting (R) • Training (C) • Documentation (C)		3X	2X		
HIPAA by NIST (Health Insurance Portability and Accountability (HIPPA) Act of 1996, enacted by the US Congress)	• Security Management Process (S) • Assigned Security Responsibility (R) • Security Awareness & Training (C) • Security Incident Procedures (S) • Contingency Plan (S) • Evaluation (T)	3X	X	X	X	
HIPAA by Leon (A Healthcare Compliance Approach by Leon, 2005)	• Leadership team (R) • Information (C) • IT solutions (T)		X	X	X	
HIPAA by Rhone & Berry (A Healthcare Compliance Approach by Rhone & Berry, 2006)	• Corporate compliance committee (R) • Compliance officer (R) • Assessing risk (S) • Education (C) • Reporting concerns (C)	2X	X	2X		
USSC Guidelines (Guidelines for Effective Compliance by United States Sentencing Commission, USSC)	• Policies, procedures and controls (S) • Commitment from top of the organisation (R) • Delegation of authority (R) • Communication of policies, procedures and controls (C) • Auditing, monitoring, and reporting (R) • Implementation and remediation (S) • Ongoing process improvement (C)	2X	3X	2X		

IT-driven Compliance Frameworks						
COBIT (Control Objectives for Information & Related Technology – a high-level governance and control framework)	• Plan and organise (S) • Acquire and implement (R) • Deliver and support (T) • Monitor and evaluate (C)	X	X	X	X	
COA (Compliance Oriented Architecture system)	• Technology (all services) (T)				X	
Active Compliance Approach (Developed by AMR Research)	• Integration infrastructure (T) • Business process management and workflow (C) • Learning and education management (C) • Content, document, and records management (C) • Data warehouse/datamart (T) • Rules engine (T) • Alerting engine (T) • Identity and security management (C) • Management dashboards and altering engine analytics (C)			5X	4X	
General Compliance Frameworks						
Two Subsystems by Mitchell (A monitoring and sanctioning system, Mitchell, 1996)	• Monitoring (S) • Sanctioning (C)	X		X		
Marchetti's Compliance Approach (A business value-generating model, Marchetti, 2005)	• Compliance strategy and framework (S) • Organisational structure (R) • Technology (T)	X	X		X	
Seven Dimensions by Zimmermann (An approach with 7 dimensions of compliance programmes, Zimmerman, 2004)	• Organisational structure and responsibility (R) • Internal specification of compliance standards (S) • Communication (C) • Training (C) • Adoption of business processes (S) • Monitoring (S) • Sanctions (C)	3X	X	3X		
Dynamics Model by Martinez-Moyano (A model comprising basic compliance processes, and the connections between, Martinez-Moyamo, 2005)	• Compliance organisation (R) • Code of conduct (S) • Compliance programme (S) • Information and consultation (C)	2X	X	X		

Preventative Compliance by Burkle (A firm-specific compliance system, Burkle, 2005)	• Compliance organisation (R) • Code of conduct (S) • Compliance programme (S) • Information and consultation (C)	2X	X	X		
Fifteen P-Compliance Model (A best-practice, step-by-step compliance framework, Warwick, 2005)	• Champion (R) • Communication (C) • Clarity (R) • Education (C) • Ownership (R) • Alignment (S) • Hijacking (Integrating compliance into corporate environment) (S)	2X	3X	2X		
OCEG (The Open Compliance & Ethics Group, a non-profit organisation's approach to compliance, governance, risk management, etc., OCEG, 2005)	• Culture (S) • Personnel (R) • Process: Plan/Organise (S) • Process: Prevent/Protect/Prepare (S) • Process: Monitor/Evaluate (C) • Process: Respond/Improve (R) • Process: Information/Influence (C) • Technology (T)	3X	2X	2X	X	
Holistic Compliance Approach (A hybrid compliance approach purported to control all compliance activities to increase ROI, Wakem, 2005)	• Vision (S) • Tone at the top (C) • Technology (T) • Monitoring (S)	2X		X	X	
ERM (A private sector-led initiative for improving financial reporting, internal controls, and corporate governance, COSO, 2004)	• Internal environment (S) • Objective setting (S) • Event Identification (R) • Risk Assessment (R) • Risk Response (R) • Control Activities (R) • Information & Communication (C) • Monitoring the entire system (T)	2X	4X	X	X	
GRC (PricewaterCoopers, a UK multinational company initiated the Governance, Risk & Compliance (GRC) approach)	• Organisation (R) • Process (C) • Technology (T) • Value (V)		X	X	X	X
Occurrences		28	25	28	13	1
Percentages (%)		**29.47**	**26.32**	**29.47**	**13.68**	**1.05**

Adapted from Pupke (2008)

Tab.2.3: Categorised Elements of Compliance Frameworks from Other Industries

Ranking of Importance	Categorised Elements of the Approaches	Occurrences	%
1	Strategy	28	29.47
2	Communication	28	29.47
3	Responsibility	25	26.32
4	Technology	13	13.68
5	Value	1	1.05
Cumulative Total			**100%**

Adapted from Pupke (2008)

Just as earlier mentioned, and based on a previous regulatory compliance study (by Pupke, 2008) conducted in the financial industry where compliance frameworks were thematically analysed to develop constructs to underpin the research of investigating compliance coordinating mechanisms, it was realised that the same approach could be utilised in uncovering the heterogeneous and plural goals or motivations of all stakeholders through a thematic analysis of existing housing space standards and related policy framework documents. A thematic analysis of these housing space standards and policy frameworks is believed to reveal the various sub-factors and variables that influence the regulatory compliance with these standards and policies.

From the tables above, it is evident that the three top-ranking elements of compliance frameworks are found to be the categories of *Strategy*, *Communication*, and *Responsibilities*. These borrowed compliance framework elements from various other industries could also be the constructs upon which this research study for regulatory compliance of housing space standards is empirically built. This implies that planning and housing stakeholder organisations could tentatively adopt the following to enhance their compliance rate of spatial requirements for New Build Homes in England (Pupke, 2008):

- Align the compliance **Strategy** of the compliance document with the organisation's strategy;
- Incorporate compliance **Communication** (compliance reporting) into the existing business communication system of business reporting;

- Integrate compliance **Responsibilities** within the existing organisation structure;
- Identify existing compliance **Technology** (IT systems) used to support the compliance process; so as to automate the compliance activities;
- Deliver **Value** with new technology by planning and controlling costs and benefits of compliance activities.

The diagram below is a representation of the findings of the Review of Literature from other industries outside of the planning and housebuilding sectors of the housing industry:

Fig.2.1: Literature Review Chart of Compliance Factors

2.3. COMPLIANCE CONCEPT OF SPATIAL REQUIREMENTS FOR THE ENGLISH HOUSING INDUSTRY

Space is one of the most important elements of building design to define the users' requirements and functions of a building. Space has become an even more important concept in computer-based information systems applied in the process of building design, construction and management (Fu *et al.*, 2007). The Housing Standards Review, concluded in the early part of 2016, was designed to streamline and simplify the planning process for creating quality and sustainable housing in the UK. Unfortunately, however, it appears to have caused a lot of confusion instead (LocalGov, 2016).

Unlike other aspects of the Housing Standards Review, the Space Standard is yet to be incorporated into the Building Regulations (DLA, 2015). Establishing compliance and any enforcement action therefore rests with the local planning authority; where planners can demonstrate local need as part of the Local Plan, thereby invoking space standards upon developers. However, rather than the existing situation where standards may vary from district to district, there is now a single set of national standards. Where applied, housing developers will find the standards fairly easy to follow, although they do invoke a minimum ceiling height of 2.3m for 75% of the floor area which may create problems with certain designs such as dome in the roof construction. Building Control will normally have no involvement in the checking or enforcement of the Space Standards. However, Building Control bodies may choose to provide checking of the Space Standard in development proposals as an additional service alongside carrying out their building control function. In these circumstances, local planning authorities may wish to avoid further additional checking of plans with regards to Space Standards (Department of Communities and Local Government, DCLG, 2015a).

The new Planning Standard, NDSS, was developed to rationalise existing space standards into a single national approach. The starting point is the need for rooms to be able to accommodate a basic set of furniture, fittings, activity, and circulation space appropriate to the function of each room. The overall objective is to ensure that all homes are highly functional in terms of meeting typical day to day needs at a given level of occupation (DCLG, 2014).

This standard deals with internal space within new dwellings, which is suitable for application across all tenures. It sets out requirements for the Gross Internal Area (GIA) of new dwellings

at a defined level of occupancy as well as floor areas and dimensions for key parts of the home, notably bedrooms, storage and floor to ceiling height (DCLG, 2015b). According to DLA (2015), GIA is described as the area of a building measured to the internal face of the perimeter walls at each floor level, including the floor areas of liveable and non-liveable rooms plus circulation, and areas taken up by internal partitions of the dwelling.

2.3.1. The Nationally Described Space Standard (NDSS)

The imperativeness of space and standards has been recognised to contribute to quality of life of dwellers; as a lot of evidence indicates the intrinsic linkages between internal space and quality of life. Space also makes available the possibilities of greater design and layout arrangement (RIBA, 2011). Hence, space standards (as part of housing standards) are officially approved as one of the most viable instruments of making certain that New Build Homes are delivered with good quality and fit for purpose in the short and long term (DLA, 2015).

In the UK, the private sector of the housebuilding industry has been incapable of delivering decent, *spacious*, quality homes to working class households; meaning – low rents called for low investments, leading to poor housing quality since the nineteenth century, as a consequence (DLA, 2015). The UK Government therefore introduced several regulations and incentives including subsidy and council house building programme to deliver a good standard product for working households (DLA, 2015). However, since the deletion of the Parker Morris Standard as a benchmark for funding of council house building in 1980, there has been a big concern over the deliberate reduction of space in New Build Homes and the problems it creates for end-users (RIBA, 2011).

The main purpose of this section is to justify the rationale behind the nationwide adoption of the NDSS and provide evidence of the benefits of housing space standards for New Build Homes. The introduction of the NDSS was intended to provide a more streamlined approach by reducing the burden of regulatory compliance through a stakeholder review and consolidation process, thereby providing clarity and consistency of use for LPAs and housebuilders (DLA, 2015). It is hoped that when the NDSS becomes a full-fledged national spatial requirement for New Build Homes, the findings from this research study would help to resolve the compliance coordination issues encountered in the English housing industry.

However, there has been a great concern for the loss of benefits that accompany reduction of space in new homes. The following evidences benefits of Space Standards drawn from a historical evolution of standards since the Tudor Walters Report in 1919 to date:

- **General Health and Wellbeing**: The advantages of general health and wellbeing resulting from living in a well-designed and ventilated home, which offers privacy and sociability, provide adequate space to function effectively (HATC, 2006);
- **Family Life and Children**: Adequate space contributes immensely to family life and enhances children's opportunity to engage in uninterrupted private study, thereby improving their potential (London Housing Strategy, 2010);
- **Productivity**: The benefit of boosting the forward link from academic achievement to productivity, and also the chances of working from home, thereby enhancing the personal life-work balance (Cassen and Kingdon, 2007);
- **Adaptability**: The benefit of flexibility of homes with sufficient space makes the home easier to adapt to changing needs, preferences and lifestyles of dwellers (Ministry of Housing and Local Government,1961; CABE, 2009; London Housing Strategy, 2010):
- **Inclusive Homes**: The advantage of inclusivity provided by homes with space to respond to dwellers modifying physical requirements as they age, and the impact of these changes on creating a more balanced neighbourhood (Ministry of Housing and Local Government,1961; Hanson, 2001)
- **Anti-Social Behaviour**: The societal advantages of reduced overcrowding evidenced by reduction in violent, anti-social, behaviours (London Housing Strategy, 2010)
- **Better Quality Homes**: The long-term benefits of creating a more stable housing market, driven by a better understanding of enduring need and utility, instead of short-lived investment ventures or decisions (Evans and Hartwich, 2005; Gallent et al., 2010)

2.3.2. Justification for New Build Homes

Research has indicated that the supply of new build housing in the UK is very inelastic and unresponsive to great increases in demand (Meen, *et al*, 2001). In a similar vein, HBF (2002) highlighted that supply of New Build Homes is abysmally low due to the *scarcity of land* for residential development, and the existence of a crisis of expectation of the best *return on investment* by the landowners.

Because of the scarcity of land supply in England and the pressing housing supply problem, the Mid-rise typology was adopted as the standard New Build Home in this study. This is

required to achieve an appropriate and balanced indicative housing density in the neighbourhood, while providing reasonably spacious and quality homes that meet the NDSS requirements (DWELL, 2016). Mid-rise, higher density residential buildings (of about 3-4 storeys) provide the opportunity of maximising density while at the same time reducing overcrowding to the end-users. Mid-rise typology also offers housebuilders the following opportunities (CABE, 2005; DLA, 2015):

- Reduction of cost of land acquisition and infrastructure;
- Reduction in the cost of lift installation and other mechanical services;
- Provision of housing flexibility over its life span;
- Creation of cost-effective building patterns, such as flatted accommodation, apartment buildings, etc.;
- Increased energy efficiency;
- Provision of adaptable life-time homes for the disabled or elderly.

2.4. SUMMARY

Compliance is the organisational efforts to ensure adherence to rules and regulations. *Compliance Approach* illustrates the regulatory compliance standards applicable to an organisation and processes and internal controls the organisation deploys to adhere to the standards in question. Therefore, a Compliance Framework assists organisations to set up, administer best practices to attain corporate compliance and performance. The relatively new housing standard, NDSS standard deals with internal space within new dwellings and is suitable for application across all tenures. It sets out requirements for the GIA of new dwellings at a defined level of occupancy as well as floor areas and dimensions for key parts of the home, notably bedrooms, storage and floor to ceiling height. The overall objective is to ensure that all homes are highly functional in terms of meeting typical day to day needs at a given level of occupation. The NDSS was developed to rationalise existing space standards into a single national approach. It is hoped that when the NDSS becomes a full-fledged national spatial requirement for New Build Homes, the findings from this research study would help to resolve the compliance issues encountered in the English housing industry. With this chapter completed, Objective 1 is deemed to be achieved. The next chapter examines the analysis of England's housing space standards and policy frameworks in detail.

CHAPTER 3
HOUSING SPACE STANDARDS STUDIES

3.1. INTRODUCTION

Over the last century, many efforts have been made to specify minimum space standards in public sector housing delivery. The strategy has become increasingly more advanced over the years, progressing through number of rooms, minimum floor area for rooms and the building as a whole, to functional/activity-based specifications. The Braun and Clarke 6-step framework of thematic analysis is used to analyse the housing space standards used in England since the start of the 20th century.

3.2. HOUSING SPACE STANDARDS ACROSS THE WORLD

3.2.1. Comparison of Housing Space Standards between England and Other Countries

Comparative studies on Space Standards between England and other countries in Europe and the rest of the world have been conducted in recent times; these studies also examined the various systems of Building Regulations, implementation, and control. The findings of these research studies reveal that each country has its own requirements for the size of habitable rooms. In some countries, however, there are supplementary requirements regarding accessibility and dwelling size. These standards are relevant to public and private developments alike. (Greater London Authority, 2006; RIBA, 2011).

3.2.2 Scotland

Since 1963, the Scottish Building Regulations established minimum Space Standards, articulated in quite many ways. Individual accounts suggest that new build homes are larger than homes in England, although there is little scientific evidence to support this claim (Greater London Authority, 2006; RIBA, 2011).

The *Scottish Building Regulations in 1963* included Space Standards taken from the *Scottish Housing Handbook: Part 3 (1956)*. These standards provided minimum room areas, aggregate areas, and storage volumes, with respect to the number of rooms or apartments in the building. In 1968, a new design guidance was published in the revised *Scottish Housing Handbook, Bulletin 1: Metric Space Standards*, which were compatible with *Parker Morris Report* and

the *Design Bulletin (DB)*. The design guidance stipulated minimum space for the overall dwelling and for storage, based on the number of bed spaces provided, but asserted that the sizes of individual rooms should be informed by the use of the room. In 1971, the space requirements of Bulletin 1 were introduced into the *Scottish Building Regulations*. In 1987, as part of the Scottish Government policy to deregulate the housing sector, the space standards were abolished from the Building Regulations. However, in 1990 the *Scottish Building Regulations* was revised, and the space standards were re-introduced, by a functional requirement, such as furniture/fittings plus activity spaces to make use of them. This was homogeneous to the *DB6* procedure, and also much the same as more recent work like the *Guide to Standards & Quality*. Activity spaces, schedules and dimensions of furniture are all laid out. In addition, the Building Regulations requires that each building must have a kitchen, comprising certain appliances, space to use it, worktop dimensions and storage volumes furnishings (Greater London Authority, 2006; RIBA, 2011).

The Scottish Building Standards Agency later commenced wide consultations on new Space Standards to be incorporated into the *Scottish Building Regulations*, which underpin this functional approach. Conformance to Bulletin 1 Space Standards remained a requirement of publicly funded housing development. Even when *Housing for Varying Needs* (another functionally based standard similar to *Lifetime Homes*) was published by Communities Scotland, many local authorities continued to allocate funding to *Bulletin 1* Space Standards. In a significant number of local authorities, there has been a mandated practice to construct new buildings in the public and private sectors to *Bulletin 1* standards. Whilst there is no hard data evidence that this has been proposed by any specific policy by the Scottish Executive, or that any evaluation has been conducted to establish the value for money and cost-benefit rations of such policies, an exercise is currently in the process to execute that with regards to proposed amendments to the Building Regulations of Scotland (Greater London Authority, 2006; RIBA, 2011).

3.2.2. Norway

In Norway, the Planning and Building Regulations are incorporated in the Planning and Building Act of 1997. Therefore, a single legislation caters for planning, site use, water consumption, accessibility, housing performance and housing standards. Whilst there are no space standards specifically included in the legislation, there are requirements to facilitate

access by disabled people (the Universal Design Standards), which have much in common with *Lifetime Homes*. However, Husbanken (the housing funding agency in Norway) established the minimum Space Standards, which shape policies influencing both private and public-sector developments (Greater London Authority, 2006; RIBA, 2011).

3.2.3. Sweden and Denmark

Standards are established in Sweden nationally with local consideration. In many cases, these tend to relate to disabled access and functional requirements similar to Standards & Quality. The National Housing Boards of both countries set standards for housing size, accessibility and site use to enhance the availability of quality housing at affordable rates. Planning and Building Regulations (which comprise space standards for room sizes and storage) are combined into a Building Permit issued by a Local Building Committee. Standards are therefore set through the counterpart of the planning and Building Control process (Greater London Authority, 2006; RIBA, 2011). In Denmark, however, there is a wide array of housing standards achieved by a combination of financial and regulatory incentives (Greater London Authority, 2006; RIBA, 2011).

Tab.3.1: Scandinavian Countries' Minimum Gross Internal Floor Areas Compared to England's NDSS

Dwelling	Norway	Sweden	Denmark	England
One room (m^2)		47		39 (37)*
Two room (m^2)	53.9	65	70	50
Three room (m^2)	63.6	80	83	74
Four room (m^2)	83.6	96	96	90
Five room (m^2)			110	103

Additional Information	Any room for living in must have a minimum volume of $15m^3$: with a standard ceiling height of 2.4m, this works out at $6.2m^2$ as minimum room size	Also set minimum floor areas per room: • Living room: $20m^2$ • Double bedroom: $12m^2$ • Single bedroom: 7m2 Also set minimum storage space for clothes: - • rooms: $6m^2$ • rooms: $7m^2$ • rooms: $8m^2$	Also set some minimum floor areas per room: • Living room: $20m^2$ • Bedroom: $10m^2$ • Storage: $3m^2$ minimum ceiling height to be 2.5m	Gross Internal Areas (GIA) for one storey dwellings include space for one bathroom and one additional WC in dwellings with 5 or more bed spaces. *Where a studio has a shower room instead of a bathroom, the floor area may be reduced from 39m2 to 37m2, as shown bracketed.

3.2.4. Other European Nations

In other countries in Europe, Space Standards are sponsored by fiscal incentives or boosted by regulatory requirements. In addition, most European countries have their Planning and Building Control operations combined into one Building Permit department, such that Space Standards are also included. The table below is a comparison of dwelling sizes between UK and other European countries:

	All dwellings			Newly built dwellings		
	A	B	C	A	B	C
UK	85.0	5.2	16.3	76.0	4.8	15.8
Italy	90.3	4.1	22.0	81.5	3.8	21.4
Portugal	83.0	4.3	19.3	82.2	4.7	17.5
Sweden	89.8	4.3	20.9	83.0	4.0	20.8
Finland	76.5	3.6	21.3	87.1	4.0	21.8
Ireland	88.3	5.3	16.7	87.7	5.2	16.0
Austria	90.6	3.4	26.6	96.0	3.7	25.9
Spain	85.3	4.8	17.8	96.6	5.1	18.9
Luxembourg	125.0	5.5	22.7	104.1	5.1	20.4
Germany	86.7	4.4	19.7	109.2	5.1	21.4
France	88.0	3.9	22.6	112.8	4.2	26.9
Netherlands	98.0	4.2	23.3	115.5	4.1	28.2
Belgium	86.3	4.3	20.1	119.0	5.8	20.5
Greece	79.6	3.8	20.9	126.4	3.2	39.5
Denmark	108.9	3.7	29.4	137.0	3.5	39.1

Fig.3.1: Comparisons of Building Sizes for the EU15 (2005): A - Floor Space (m^2); B - Number of Rooms; C - Room Size (m^2), (European Union, 2005).

The table below illustrates some of the European Countries' Housing Space Standards and the corresponding Space Metrics used.

Tab.3.2: European Countries and their Space Standard Metrics

Countries	Space Standard Metrics
Scotland	Functional criteria and minimum space for some rooms
Norway	Minimum areas for rooms
Sweden	Gross dwelling area
Denmark	Gross dwelling area
Belgium	Gross habitable area per occupant
France	Net habitable area per occupant
Germany	Minimum areas for rooms

Netherlands	Habitable area for dwelling, plus functional space standards for individual rooms
England	Gross internal area

3.2.5. Asian Countries: Singapore, Hong Kong, Taiwan, and Japan

The Government of Singapore does not have standards for the floor area of private homes. Also, there are no standards for the living density of residential houses in Singapore, nor are there standards for kitchen and toilet facilities. The height of living, dining and bedrooms is about 2.6m, while that of kitchen and bathroom is about 2.2m (Eva, *et al*., 1999). Living space or floor area for new build housing does not exist in Hong Kong. Also, standards for living density are non-existent (Eva, *et al*., 1999). Living space or floor area for new build housing does not exist in Taiwan. Also, standards for living density, and kitchen and toilet facilities are non-existent (Eva, *et al*., 1999). Japan has a set of standards for living space and living density, which are only guidelines. The living space metric is *floor area per housing unit* or *floor area of dwelling rooms* (Eva, *et al*., 1999).

3.3. CURRENT STATE OF ADOPTION OF HOUSING SPACE STANDARDS IN ENGLAND

In today's England, the housing market influences what is built, or more appropriately put – space standards are influenced by what the people are willing to purchase (Gallent, et al, 2010). In the late 1800s, public health and hygiene concerns such as bedroom sizes, window dimensions, and ceiling heights, were not the main drivers behind the implementation of housing standards (Park, 2017). But by the late 1800s, public discourse on internal housing space had begun to raise concerns for housing density. The Housing Manual policy document of 1949 revealed that space standards adoption had declined; not because of revised human accommodation measurements, but as a result of changes in political priorities, which were a shift from housing quality to housing quantity, and the blotting out of public housebuilding by private-sector housing provision (Gallent, et, 2010). Fierce competition for land use beats down internal space standards and revved up housing densities in the areas. Pressure on adoption of space standards arose from diverse directions ranging from planning to allocation of land for

housing use; and from intense competition from the private sector within a more luxurious land market (Gallent, et al, 2010).

From the earliest times when space standards were first introduced in the 1900s, the private sector remained unregulated and uncontrolled by the public sector, and house developers have been impervious to the establishment of floor-space standards, thereby threatening the attainment of other planning objectives such as increases in supply, affordability, and escalation of land use in the urban areas (Gallent, et al, 2010). According to HATC (2006), space standards were considered in principle a material planning initiative and a tool for sustainable development in the wider community. Though, at the time, it did not appear that the Building Regulations was an apparatus with which space standards could be established, it became the most reasonable option when public discourse shifted in favour of a national space standard (HATC, 2006). But questions would arise concerning the difficulty planning officers would face in ensuring compliance with the standards; they would need to make decisions on the level of checking to be performed, they would need to check that the building information provided by the developers are accurate; and "*Would it be an administrative bottleneck on the applicants to provide such information*?" (HATC, 2006). Add to that, it has been estimated that it would take the developer about 3 minutes per dwelling type to supply such information with the use of CAD (HATC, 2006).

Sir Parker Morris' concern for functional and usability factors redefined societal thinking on internal housing space standards (Drury, 2008). Gallent, et al (2010) noted that although there are many forces at play that shape and influence housing products, stricter regulation and market economics will continue to play a key role in the delivery of local products that may even exceed the floor space minimum requirements. Park (2017) maintained that if proper regulation is maintained under a normal market condition, housing space standards will completely remove low-quality housing delivery.

Across the continent of Europe, the size of any apartment flat on rent or sale is widely provided in *squared metres*; in England, however, to sell an apartment flat, the emphasis is mostly on the *number of bedrooms*, which does not supply a precise information about the actual dwelling size in terms of internal floor space. Thanks to the Property Misdescriptions Act of 1993, this has led to expectations that England will adopt this European convention, rather than letting prospective buyers to guesstimate apartment sizes based on the number of bedrooms contained

therein; for instance, marketing a flat/house as a 2 bed 3 person flat (2b3p) rather than specifying the precise floor space area as a marketing strategy (Gallent, et al, 2010; Park, 2017). Also, there is also the practice of declaring houses to have below its designed occupancy on the marketplace. For instance, the second bedroom in a 2b3p house may be the reason to declare it as a single bedroom house, so as to comply with the internal space standards (HATC, 2006). In addition, Vale (2002) spotted a loophole where a 2b3p dwelling is marketed as a 2b4p one; Vale suggested that this ambiguity is manageable if local authorities would exercise a control mechanism of establishing clear regulatory requirements for *unit mix*. Vale defined unit mix as "the number of apartments of different sizes and their distribution". Table 3.3. illustrates what unit mix means.

Tab.3.3: Unit Mix in New Build Housing

House Size	Affordable Housing	Social Housing
1 bed 2 person	45%	15%
2 beds	45%	45%
3 beds	10%	30%
4+ beds	–	10% (of which up to 2% should be 5 beds)
Family: 3+ beds	10%	40%

Adapted from Wandsworth Council (2016)

Carmona, et al (2010) submitted that the lack of uniform and established housing space standards across England today is linkable to the decreasing provision of homes suitable to meet households' needs. Furthermore, according to Gallent, et al (2010), the deployment of space standards into various room plans is essential for house developers, since more variability in room functionalities translates to more clients. Any rigidity in the standards, Gallent, et al posited, would preclude the private sector from meeting the demands and needs of the housing market. Carmona, et al (2010) maintained that there is a strong link between space and density, which is achievable via specific housing typologies of high-rise apartment buildings.

Space Standards were perceived as a point of conflict between the public and private sectors of the planning and housebuilding industry, not as a means of complying with fundamental spatial minimum requirements (Gallent, et al, 2010). However, a uniform space standard would engender a level playing field for all stakeholders to achieving housing quality, setting

fundamental minimal requirements, and establishing certainty for house developers (Park, 2017). But then, there is the cogent question of whether established space standards would be wholly welcomed into the existing political and developmental culture of local communities in England or whether the adoption of these standards would only be possible after a notable cultural shift has occurred (Gallent, et al, 2010). Carmona et al (2010) also shared a similar concern that space standards may be established below the cultural norm, as the quality of homes may be benchmarked against long-term usability and adaptability, especially when there is no easy access to credit available to developers. In most large cities like Manchester, London, Liverpool, etc., for instance, the housing markets are investor-led, such that the rental investors (buyers), as well as the house developers (sellers) are concerned mostly with profit-making. This mercantile alliance between the buyers and the sellers have jeopardised the floor space standards of new build housing (Gallent, et al, 2010).

Furthermore, there is a conflict in policies by the English central government in the sense that the government advocates for increasing housing densities and would even get involved in communities where the density is less than 30 dwellings per hectare to salvage the situation to the detriment of existing space standards. The outcome of this policy clash or conflict is that house developers have misconstrued and exploited the situation to mean that increased housing density is the same as decreased floor space of New Build Homes (HATC, 2006).

In concluding this section, the application of minimum space standards for new build housing development is perceived as a vital tool of delivering on quality; however, there are concerns by the Government that a universal space standards application may not represent the housing needs and aspirations of a broader spectrum of households (DCLG, 2017).

As regulatory compliance policy documents and housing space standards changed over the years, the metrics used to quantify spaces within New Build Homes also evolved. The table below illustrates the housing space standards and their corresponding space standards metrics used.

Tab.3.4: Housing Space Standards Metrics in England

Year	Space Standards	Space Standards Metric
1918	Tudor Walters Report	Number of rooms
1961	Parker Morris/Design Bulletin Standard	Minimum floor space for bedrooms and the building as a whole
1991	Lifetime Homes	Functional-based requirements
1998	Guide to Standards & Quality	Activity-based requirements
2011	Housing Quality Indicators	Quality Indicators incorporating site features, building fabric performance and design quality
2015	Nationally Described Space Standard (NDSS)	Gross internal area

From the table above, it is evident that efforts have been taken to curb the non-compliance of housebuilding stakeholders to various housing space standards, by revising the space metrics so as to easily track compliance violations. The NDSS space metric of GIA is the standard unit to measure the relationship between compliance to spatial requirement, spatial quality, and profitability.

3.4. HOUSING SPACE STANDARDS DOCUMENTS USED IN ENGLAND

An understanding of the Compliance Theory facilitated the unearthing of the heterogeneous and plural goals of stakeholders through the thematic analysis of existing housing space standards and policy frameworks. As shown in the table below, the research documents were drawn from Government Policy Frameworks and Housing Space Standards (HSS) used in the English housebuilding industry. Because of the nature of the research, it was cumbersome to find academic journals and related materials focused exclusively on regulatory compliance of spatial requirements. Therefore, the selection criteria of research documents were based on a purposive sampling judgement of what really constituted the knowledge of housing policy and space standards in the English housebuilding industry.

3.4.1. Thematic Analysis of HSS and Policy Frameworks

In the ensuing sections, the Braun and Clarke (2006) six-step framework of *Thematic Analysis* was applied for the investigation of the compliance factors influencing the adoption of Space Standards for New Build Homes in England. As fully described in the qualitative methodology, *Thematic Analysis* is the process of identifying themes or patterns within some type of qualitative data (Maguire and Delahunt, 2017). These six steps are briefly listed below:

- Step 1: Familiarising oneself with data
- Step 2: Generating initial or preliminary codes
- Step 3: Searching for themes
- Step 4: Reviewing themes
- Step 5: Defining and naming themes
- Step 6: Producing the report

However, before we could begin step 1 of data familiarisation, nominal codes need to be assigned to the selected documents and policy frameworks, as shown below:

Tab.3.5: Assigning Codes to Selected Documents

Literature Type	No	Full Title of Document	Author/Publishing Body	Year	Assigned Codes
Government Policy Frameworks	1	Tudor Walters Report	Tudor Walters Committee of the UK House of Parliament	1918	GPF1
	2	Dudley Report	Ministry of Health & Ministry of Works, Great Britain	1944	GPF2
	3	Housing Manual	Ministry of Housing & Local Government, Great Britain	1949	GPF3
	4	Sir Parker Morris Report: Homes for Today and Tomorrow	Ministry of Housing & Local Government, Great Britain	1961	GPF4

	5	Housing Act 1985, Part 10	UK House of Parliament	1985	GPF5
Private Policy Frameworks	6	Lifetime Homes Standard	Joseph Rowntree Foundation & Habinteg Housing Association	1991	PPF6
	7	Guide to Standards & Quality in Development	Andrew Drury for Housing Association Training & Consultancy (HATC) Ltd	1998	PPF7
Private Space Standards	8	Gentoo Housing Standards	Gentoo Housing Group Ltd	2007	PSS8
Government Policy Framework	9	London Housing Design Guide – Interim Edition	Greater London Authority	2010	GPF9
	10	Homes and Communities Agency	Department for Communities & Local Government, UK	2010	GPF10
	11	Housing Quality Indicators	Department for Communities & Local Government, UK	2011	GPF11
	12	National Planning Policy Framework	Department for Communities & Local Government, UK	2012	GPF12
	13	National Planning Practice Guidance	Department for Communities & Local Government, UK	2014	GPF13
Government Space Standards	14	Technical Housing Standards – Nationally Described Space Standard	Department for Communities & Local Government, UK	2015	GSS14

(STEP 1: FAMILIARISING ONESELF WITH DATA)

According to Braun and Clarke (2006), the first step of this iterative process involves transcription of data, reading and re-reading the data, and jotting down initial ideas or early impressions. Hence, each of the policy frameworks or space standards was transcribed, read, re-read, and noted down under the sub-sections of Regulatory Basis and Origin, Objectives of the Policy Framework, and Compliance Requirements, as follows:

3.4.2. GPF1: Tudor Walters Report (1918)

3.4.2.1. Regulatory Basis and Origin

The Tudor Walter Committee was set up by the government after the First War to assess conditions of housing at the time. The committee recommended that housing should be state-subsidised, with housing standards based on the Garden City principle (a holistically planned new settlement that provides high-quality affordable housing and accessibility to the workplace in healthy, beautiful, and social communities, whilst promoting a sustainable environment), giving the LPAs the power to develop council housing for rental purposes.

3.4.2.2. Objectives of the Policy Framework

In 1919, the issue of floor space standards in council houses was raised for the first time. Regulations were set to define the spatial needs of dwellers occupying council houses; a unanimous decision not to regulate housing products of private enterprise was reached. The benchmark stipulating maximum densities of 30 dwellings per hectare and floor space area minimums of 79.4m2 (for 3-bedroom house with no living room) and 98m2 (for 3-bedroom house with living room) was established.

3.4.2.3. Compliance Requirements

The Tudor Walter requirements are stated in the table below:

Tab.3.6: Tudor Walter Spatial Requirements

Criteria	Standard
Minimum room number	At least 3 ground floor rooms
Minimum bedroom number	At least 3, of which 2 must take 2 beds
Essential	Bathroom and storage
Density	12 dwellings per acre
External	• Built as semi-detached or in short terraces

	• Cottage appearances enhanced by frontal and rear gardens • 21m minimum distance between facing rows of houses

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.7: Tudor Walter Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
Chaired by Tudor Walters, the Tudor Walters Committee of the United Kingdom Parliament, produced a report named after its chairman. Unwin played a major role on the committee	Compliance Committee	▪ Review of housing conditions, and ▪ Recommendation that housing be state-subsidised with specific standards.
Housing in short terraces, spaced at 21m at a density of 30/ha in town or 20/ha in the county; this was to allow the penetration of sunlight even in winter.	Compliance Requirement	▪ Setting regulations to define the spatial needs of council housing, which was represented in a table known as the Tudor Walter Requirements
Profoundly influence the general standard of housing in the country and to encourage the building of houses of such quality that they would remain above the acceptable minimum standards for at least sixty years	Regulatory Function	▪ The LPA given the task of regulating the development of council housing for rent according to specified standards.
In the years leading up to the First World War, almost all new housing was provided by private builders.	Developmental Function	▪ The Housebuilder given the task of developing new council houses, adhering to the specified standard.
The Committee noted the advantages of a varied provision of housing types and not restricting an estate to one social class.	Market Consideration	▪ Regulatory decision taken to not interfere with the products of the private housing sector driven by the forces of demand and supply.

3.4.3. GPF2: Dudley Report (1944)

3.4.3.1. Regulatory Basis and Origin

The Dudley Report reflected on the market opportunities that arose from the use of new construction technologies, and the considerable demand for prefabricated short-term housing to meet the massive post-war needs.

3.4.3.2. Objectives of the Policy Framework

Adverse housing shortages, exhausted labour force, and undersupply of building materials called for innovative solutions which ushered in the era of prefabrication and unconventional building methods. The policy framework provided useful information to the LPAs on housing design, site layout, density, house typologies, room size, flat, building efficiency, heating and insulation, new methods, and materials, etc.

3.4.3.3. Compliance Requirements

The emphasis of the policy framework was mainly on the development and delivery of 3-bedroom in 2-storey houses to end-users, with a spatial requirement of 83.6m^2 gross internal area (GIA).

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.8: Dudley Report Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
The report made recommendations about house design in terms of minimum room sizes and adequate circulation space. By adopting these recommendations as the minimum to be achieved if houses were to qualify for subsidy, the central government was able to raise standards and exert its influence over local authorities, allowing them to have their own schemes designed within this framework. The report provided local authorities with guidance as to the minimum acceptable 'standards after World War 2.	**Policy Guidance**	▪ Provision of guidance on housing design, site layout, housing density, typology, room size, building efficiency, etc.
The Local Authorities were shown by the Dudley Report to have been out of touch with modern trends, as they had	**Construction Innovation**	▪ Use of new technologies such as prefabricated and

generally followed the dictates of the Tudor Walters Report of 1919. The Dudley Report concluded that the design of pre-war council house dwellings was lacking in variety, offered insufficient living space and required higher standards of services to be provided within the houses.		unconventional building methods.
With regard to space standards, the Dudley Committee proposed a minimum of 83.6 sq. m for a 3-bedroomed house; a standard that was mostly exceeded during the Labour Government up to 1951.	**Compliance Requirement**	▪ A floor space requirement area of 83.6m^2 GIA for 3-bedroom – 2-storey houses.

3.4.4. GPF3: Housing Manual (1949)

3.4.4.1. Regulatory Basis and Origin

The Planning and Housing System, in 1947, was quite restrictive of the supply of land for housing development, hence, floor space standards began to reduce. Generally, adherence to the housing space standards deteriorated due to political prioritisation, such that there was a paradigm shift from housing *quality* to *quantity* and improved private investment, thereby leading to the decline of public/social housebuilding provision.

3.4.4.2. Objectives of the Policy Framework

There was the exigent need to build more houses to arrive at higher densities in the communities. This called for developments of varieties of house typologies to meet the varied requirements of the whole population.

3.4.4.3. Compliance Requirements

There was evidence to show that the dwellers of this period required more space for cooking, storage, and private study, which led to an addition of 9.3m^2 to the Dudley requirement, adding up to 92.9m^2.

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.9: Housing Manual (1949) Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
The 1949 Housing Manual contained information on the planning and layout of homes for the post-war construction era, which was intended for the guidance and regulatory compliance by local authorities.	**Compliance Strategy**	▪ The need to develop more buildings to meet higher housing densities of the area.
In this period there were significant developments in the planning system, which led to a paradigm shift of government's focus of providing quality housing for a few, living in the urban areas to provision of social housing to the many. Hence, there were restrictions in curbing uncontrolled expansion of the suburbs which started in the 1930s.	**Political Priority**	▪ Changing political prioritisation and shift of focus from housing *quality* to *quantity*. ▪ Heavy restriction on development land supply (for suburban development).
In the development of these towns and other residential areas, planners were adopting new concepts, including the neighbourhood unit approach - establishing units of 5,000 – 10,000 people with their own dedicated facilities. The concept of mixed-accommodation developments, in which people up-sized or down-sized progressively though their lives, was also explored in towns and cities across the country.	**Market Response**	▪ A call for the development of varieties of house typologies to give customers varied housing alternatives.
The Minister in charge of Housing at the time argued that new council housing should be of a higher standard. Consequently, a space standard of 92.9 sq.m, as opposed to the post-war standard of 83.6 sq.m, was flexibly adopted. The Minister's view was not only that working-class people should have good housing, but also that council housing should be of such a standard as to be attractive as a form of housing tenure to all social classes.	**Compliance Requirement**	▪ A floor space area of 92.9m^2 GIA for 3-bedroom houses; not a strict set of standards.
The 1949 manual provides guidance and examples of best practice, but it was not issued as a set of standards that had to be followed.	**Policy Guidance**	▪ Provision of guidance and best-practice examples.

3.4.5. GPF4: Parker Morris Report (1961)

3.4.5.1. Regulatory Basis and Origin

The Parker Morris Report (1961) remains the most frequently used point of reference for space standards amongst professionals in England and across the UK, although it is a standard the public and private sectors do not seem to attain. When houses are being marketed, the convention in most European nations is to describe building size by floor area, whereas in the UK, building size is described by the number of bedrooms in the building. The use of housing space standards did not always result in well-designed housing. Rather, this was the period of high-rise buildings, which were not so popular. This brings to the fore that effective space standards are not enough to achieve a standard design quality, however, effective site planning and construction are highly needed (Greater London Authority, 2006; RIBA, 2011).

3.4.5.2. Objectives of the Policy Framework

The Parker Morris committee was appointed to review design standards and family housing equipment, and other residential housing types. The report expatiates on neighbourhood balance and the needs of the community, which was within the ambit of the LPAs. Despite the significance accorded *floor space area*, the committee's concern for *usability* and *usability factors* greatly revolutionised the concept of internal space standards. *Usability* was defined as a number of design decisions like positioning of windows/doors, layout design, etc.; meaning that a single bedroom of $8m^2$ that is well laid out may be more functional than a bedroom of $9m^2$.

3.4.5.3. Compliance Requirement

The Parker Morris standard was expressed in terms of *numbers of residents*. The report acknowledged that increasing prosperity and better quality of lifestyle required more space and adaptability to changing situations. In order to meet these needs, the Morris committee proposed the following set of standards for new build homes:

Tab.3.10: Parker Morris Standards

Dwelling type	**1p**	**2p**	**3p**	**4p**	**5p**	**6p**
Internal Floor Area (m²)						
Flat	29.7	44.6	56.7	69.7	79.0	86.4
Maisonette				71.5	81.8	91.9
Single story house	29.7	44.6	56.7	66.9	75.3	83.6

2 storey semi or end	71.5	81.8	91.9
2 storey centre terrace	74.3	84.5	91.9
3 storey house		93.8	97.5

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.11: Parker Morris Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
This period was the heyday for council house building and slum clearance, with public sector house building exceeding private in several years. However, the adoption of dwelling space standards did not always lead to well designed, popular housing. The space standards were derived from an assessment of the functions of a dwelling and rooms. It also highlighted the need for storage space, calling for all rooms in the house to be heated.	**Design decisions**	▪ Space standards were not enough to drive housing quality; ▪ *Usability factors* or *functionality* were major drivers.
The long-term view is taken: 'additional space is also an important long-term investment, for if a house or flat is large enough it can usually be brought up-to-date as it gets older; but if there is not enough space improvements can be impossible, or at least unduly expensive	**Market Consideration**	▪ Sizes of houses are marketed by the number of bedrooms, not by floor space area
The Parker Morris report did not provide model floor plans or specify minimum room sizes, believing this would inhibit flexibility in the design of a dwelling. What it defined was minimum sizes for an entire dwelling without specifying how the interior of the dwelling should be partitioned. For example, the Parker Morris report specifies a one bedroom flat for two people to be at least 44.6 sq.m in size, but no example layouts are provided.	**Compliance Requirement**	▪ Specification of floor area of 44.6m^2 for a 1-bed flat for 2 people.
"…changes in the way in which people want to live, the things which they own and use, and in their general level of prosperity, and perhaps the greater informality of home life, make it timely to re-examine the kinds of homes that we ought to be building, to ensure that they will be adequate to meet the newly	**Compliance Outcomes**	▪ Adherence to the space standard is the starting point for *flexibility* and *adaptability*

emerging needs of the future, as well as basic human needs which always stay the same."		
This was the era of multi-storey, industrialised building, etc, many of which proved unpopular. This highlights that good quality design requires not just good space standards, but also good site planning and good quality construction.	**Construction Technology**	▪ Effective space standards are not enough to achieve a standard design quality; ▪ Effective *site planning* and *precise construction* are highly recommended to achieve design quality.

3.4.6. GPF5: Housing Act (1985)

3.4.6.1. Regulatory Basis and Origin

The Housing Act (1985) stipulates that a house is deemed overcrowded when the number of individuals sleeping in the house is such that the *room* and *space* standards are violated.

3.4.6.2. Objectives of the Policy Framework

The space standard is breached when the number of persons sleeping in a house exceeds the allowed number, with regards to the number of rooms and floor area of the house.

3.4.6.3. Compliance Requirement

This Act sets minimum space standards for room sizes depending on the number of individuals sleeping in them. These standards, which apply to all housing tenures - public or private, are:

- 1 person-room: 6.5m^2
- 2-person-room: 10.2m^2

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.12: Housing Act (1985) Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
This Act of Parliament established a generic space metric of minimum floor areas without specifying any dimensions.	**Compliance Requirement**	▪ Established space metric is minimum floor areas for bedrooms.

3.4.7. PPF6: Lifetime Homes (1991)

3.4.7.1. Regulatory Basis and Origin

During the 1980s, the Joseph Rowntree Foundation (JRF) became apprehensive about the quality of British new homes because of a lack of accessibility and convenience experienced by a large proportion of the population. The concept was developed by some housing experts, collectively known as JRF, and they published 16 design standards that make certain that a new home will meet the needs of most end-users

3.4.7.2. Objectives of the Policy Framework

Lifetime homes describe 16 design criteria that establish a robust framework for adaptable and accessible housing to meet the housing needs of most dwellers.

3.4.7.3. Compliance Requirement

Some of the 16 design criteria are:

- Parking space capable of widening to 3300mm
- Distance from the car parking space kept to a minimum
- Level or gently sloping approach to the lifetime home
- Accessible threshold – covered and lit
- Communal stairs to be easily accessible and lifts to be fully wheelchair-accessible
- Width of door and hall allow wheelchair access
- Turning circles for wheelchair in ground-floor living rooms
- Living room at entrance level
- Identified space for a temporary entrance level bed
- Accessible entrance level WC plus opportunity for shower later
- Walls able to take adaptations, etc.

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.13: Lifetime Homes Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
In 1991 the Lifetime Homes concept was developed by a group of housing experts who came together as the Joseph Rowntree Foundation Lifetime Homes Group.	**Compliance Committee**	▪ Comprises a group of housing experts meeting together
The Joseph Rowntree Foundation became particularly concerned about the quality of British housing and in particular how inaccessible and inconvenient many houses were for large segments of the population - from those with young children through to frail older people and those with temporary or permanent disabilities The majority of residents viewed most of the 16 design standards as important. They were certainly of value to the broad spectrum of residents in this study.	**Market Demand**	▪ A large section of the population experienced a lack of *accessibility* and *convenience* in their new homes
Lifetime Homes have sixteen design features that ensure a new house or flat will meet the needs of most households, thereby setting functionality requirements for rooms and dwellings rather than setting minimum floor areas.	**Compliance Requirement**	▪ 16 design features/criteria were listed for new homes
The accent is on accessibility and design features that make the home flexible enough to meet whatever comes along in life: a teenager with a broken leg, a family member with serious illness, or parents carrying in heavy shopping and dealing with a pushchair.	**Priority**	▪ On *accessibility* and *convenience* of the new home for later life

3.4.8. PPF7: Guide to Standards & Quality (1998)

Regulatory Basis and Origin

This Guide to Standards & Quality policy document authored by the National Housing Federation was developed from the *Parker Morris* report of 1961.

3.4.8.1. Objectives of the Policy Framework

This document entails identification of the amount of space required to allow rooms and houses to meet their functional purposes. Although, at the conclusion of the *Guide to Standards & Quality* report, there were discrepancies as to the amount of space required by occupants.

3.4.8.2. Compliance Requirement

The policy framework did not establish minimum floor areas as standard metric but set *activity-based requirements* for rooms and dwellings. In the perspective of the framework, this has an advantage of improved effectiveness of providing sufficient space, reflecting on design issues of room shape, size, and window/door positioning. However, the downside of using the activity-based requirement is that it could be cumbersome or complex to use.

(STEPS 2 & 3: GENERATING INTIAL CODES & SEARCHING FOR THEMES)

Tab.3.14: Guide to Standards & Quality Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
This document followed the approach of Parker Morris report, namely that of identifying the amount of space needed to allow rooms and dwellings to fulfil their functions, although it came to different conclusions over the amount of space needed by occupants.	**Compliance Strategy**	▪ Identification of the amount of space required to allow rooms and houses to meet their functional purposes
Setting functionality requirements for rooms and dwellings has the advantage of being more effective in ensuring sufficient space is provided, reflecting issues such as the designed room shape, size and position of windows and doors. However, they suffer from the disadvantage of being more complex to use.	**Design Decision**	▪ Improved effectiveness of designing sufficient space, ▪ Reflecting on issues of room shape, size and window/door positioning.
This policy framework established functionality requirements for rooms and dwellings rather than setting minimum floor areas.	**Compliance Requirement**	▪ Establishment of *activity-based requirements* for rooms and dwellings

3.4.9. PSS8: Gentoo Housing Group (2007)

3.4.9.1.Regulatory Basis and Origin

The Gentoo Sunderland Housing Group originated from the 2006 Greater London Authorities (GLA) standards, which was published as a recommendatory guidance to the public in the form of a traffic light system approach ranging from *red*, to *amber* to *green*. The GLA standards were not intended to be best practice standard but a required minimum for habitable private and public housing developments.

3.4.9.2. Objectives of the Policy Framework

The purposes and procedures of the Gentoo letting policy are designed to assimilate customer housing needs and facilitate their choices. The policy provides an open, transparent, fair, and approachable service of home lettings. Prospective buyers will have access to a high standard service that is accommodating and responsive to housing demand, choices, and household situations. The sole aim of the letting policy is to create enabling and sustainable localities, whereby end-users assess their housing needs and become actively engaged in selecting a property that appeals to them. The report provides objective and constant advice about various housing options to any prospective buyer of a new home.

3.4.9.3. Compliance Requirement

There is no mention of any space standards requirement in the policy report.

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.15: Gentoo Housing Group Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
The key aim of the lettings policy is to create sustainable communities in and around Sunderland.	**Compliance Strategy**	▪ Creation of *enabling* and *sustainable communities* in Sunderland.
The policy thrust of Gentoo Group's work is about creating great places to live. By encouraging customers to engage directly and choose where they live, we feel they will be committed to their neighbourhood. In this way communities will become more sustainable.	**Policy Guidance**	▪ Provision of constant advice about various *housing options* to any *prospective buyer* of a new home

Operate a customer-focused lettings service that is responsive, open, accessible and transparent.	**Platform**	▪ A platform of openness, transparency, and fairness; ▪ An approachable service for new home lettings.
Prospective customers will have equal access to a reliable, high quality service that is responsive and sensitive to demand, choices and household circumstances.	**Market Options**	▪ Access to a high standard service that is responsive to *housing demand*, *choices*, and *household situations* by prospective home buyers.

3.4.10. GPF9: London Housing Design Guide (2010)

3.4.10.1. Regulatory Basis and Origin

This policy framework is derived from an inventory of needed furniture as well as space required for activities, access around furniture, and also Lifetime Homes Standards of 1991. The application of the spatial requirements of this standard is intended for public and private housing. However, space standards are not really a guarantor of quality, but they must be implemented by robust procurement forms and long-term management methodology plans.

3.4.10.2. Objectives of the Policy Framework

The design guide policy document does not seek to proffer another set of policy guideline, but it is derived from current best practice guidelines – simplified and tailored to meet the needs of the London metropolis. The development of the framework focused on the identification of generally requirements that would improve the existing quality of housing. Out of all the requirements identified, the requirement of *minimum space standards* was significant; and to ascertain that they were viable, it was introduced as the new evidence base. There is no level of design expertise or criteria that can cover for small flats or houses. The minimum space standard is geared to enhance quality of life of the resident, and make sure that new homes are accessible, flexible, and adaptable to the changing circumstances of the resident and other occupants.

3.4.10.3. Compliance Requirements

This subsection establishes the minimum standards for gross internal area of new housing, specifying the sizes and layout of rooms.

Tab.3.16: London Housing Guide Standards

	Housing typology (bedroom/persons)	Essential GIA (m^2)
Single-storey house	1b2p	50
	2b3p	61
	2b4p	70
	3b4p	74
	3b5p	86
	3b6p	95
	4b5p	90
	4b6p	99
Two-storey house	2b4p	83
	3b4p	87
	3b5p	96
	4b5p	100
	4b6p	107
Three-storey house	3b5p	102
	4b5p	106
	4b6p	113

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.17: London Housing Design Guide Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
A consultation held in July 2009 produced a constructive and wide-ranging debate on the implications of the guide for the future of housing developments in London. There was overall support for the aspirations of the framework: to encourage good design and to deliver high-quality, well-designed homes built to a high standard.	**Compliance Strategy**	▪ Focus on the identification of general requirements that would improve the *existing quality* of housing in London metropolis.
The development of the guide focused on identifying new requirements that would make a difference to the quality of housing. The most significant of these is the minimum space standards, and to ensure these are robust, a new evidence base was established.	**Compliance Requirements**	▪ The most significant of the housing requirements was the *minimum space standard.*
A fundamental aim of this guidance is to ensure that London's housing is flexible and accessible in use and adaptable over the life of a building. Housing should support family life,	**Compliance Outcomes**	▪ The standards will improve the quality of life of residents, and ensure that new built homes are accessible, flexible, and

both in the flexibility and adaptability of homes and in the provision, in greater quantities, of larger homes.		adaptable for a lifetime use by the resident.
The document established that when space standards are not strictly adhered to, there is no level of design expertise or criteria that would make small flats or houses much better or more habitable.	**Design Decision**	▪ The document operates on the policy that mandates that no level of design expertise or criteria can account for small flats or houses.
Standards alone are no guarantee of quality; they must be underpinned by robust forms of procurement and long-term management plans.	**Value-driven methodology**	▪ Space standards on their own are no guarantee for quality ▪ Standards must be supported by viable forms of *procurement* and long-term *management plans.*

3.4.11. GPF10: Homes & Communities Agency (2010)

3.4.11.1. Regulatory Basis and Origin

This policy framework is used for social housing in England.

3.4.11.2. Objectives of the Policy Framework

The document stipulates that registered providers should ensure that tenants meet the standards established in Section 5 of the Government's Decent Homes Guidance; and continue to maintain the quality of their homes with the standard.

3.4.11.3. Compliance Requirement

The standard required is the *minimum space standard* measured in gross internal area (m^2).

Tab.3.18. Homes & Communities Agency Standards

Housing Typology	Gross Internal Area (GIA/m^2)	HCA
Flats	1b2p	48
	2b3p	61
	2b4p	70
	3b5p	86
	4b6p	99
2-Storey House	2b3p	71
	2b4p	80
	3b5p	96
	4b6p	109

3-Storage House	3b5p	101
	4b6p	114

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.19: Homes & Communities Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
This policy framework, taken together with the documents listed below comprises the regulatory framework for social housing in England applicable from 1 April 2012.	**Compliance Strategy**	▪ The policy framework is tailored-made for social housing in England
It was established that the minimum space standard metric to be used will be measured in gross floor area.	**Compliance Requirements**	▪ Minimum space standard, measured in gross floor area (m^2)
This policy framework ensures that tenants' homes meet the standard set out in section five of the Government's Decent Homes and continue to maintain their homes to at least this standard	**Policy Guidance**	▪ The manual derives from the Government's Decent Homes Guidance document

3.4.12. GPF11: Housing Quality Indicators (2011)

3.4.12.1. Regulatory Basis and Origin

Consequent on the publication of the *Guide to Standards & Quality* (1998), the Department of the Environment inaugurated DEGW Consultancy to develop a methodology for evaluating housing quality. The HQI tool built on previous efforts of development in France and New Zealand, by devising a scoring mechanism tool for evaluating housing quality by the use of standards set out in the *Guide to Standards & Quality* document. The HQI development was a major breakthrough in research and development, in which DEGW Consultancy identified a set of matrices representing dimensions of room based on *function-based space standards*. The consultancy further developed the matrices to a more detailed space standard to include the *dwelling floor space*.

3.4.12.2. Objectives of the Policy Framework

The HQI tool is an assessment and measurement tool invented to allow existing or proposed housing developments to be assessed based on quality rather than cost.

3.4.12.3. Compliance Requirements

The HQI assessment tool comprises ten indicators or sections that measure quality, whereby each indicator contains a set of questions to be completed by the Registered Landlord. The indicators are listed below:

1. Location
2. Site – visual impact, layout and landscaping
3. Site – Open space
4. Site – Routes and movement
5. Unit – Size (Indicator 5 to be scored assuming *full occupancy* in the building unit)
6. Unit – Layout
7. Unit – Noise, light, services, and adaptability
8. Unit – Accessibility within the building
9. Unit –Sustainability
10. External environment – Building for Life

It is imperative to link dwelling design to the living preferences of the dweller, and the context in which the dwelling is situated. Hence, indicators 5-9 focus on the unit and design in detail, while indicators 1-4 and 10 focus on the context and the surrounding of the dwelling

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.20: Housing Quality Indicators Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
The Housing Quality Indicators (HQI) system is a measurement and assessment tool designed to allow potential or existing housing schemes to be evaluated on the basis of quality rather than simply of cost.	**Compliance Strategy**	▪ The HQI tool is an assessment and measurement tool invented to allow existing or proposed housing developments to be assessed based on *quality* rather than cost.
The main body of HQI contains information on the ten indicators/sections that measure quality. The HQI system is designed to assess housing needs for the general population. It is not intended to cover the specialist requirements for sheltered, special needs and/or supported housing with the exception of	**Compliance Requirements**	▪ Comprises the 10 indicators of the HQI tool

'Designated supported housing for older people'.		
The HQI emphasises the development of a methodology or approach for evaluating or measuring housing quality for residents.	**Value-driven methodology**	▪ Development of a methodology for evaluating *housing quality*

3.4.13. GPF12: National Planning Policy Framework (2012)

3.4.13.1. Regulatory Basis and Origin

The National Planning Policy Framework introduces the UK Government's planning policies and how they are to be implemented to the extent that is relevant, reasonable, and proportionate. It provides a broad framework within which local communities can develop their own unique locality plans, reflecting the needs and priorities of their communities.

3.4.13.2. Objectives of the Policy Framework

The policy document sets out to deliver a wide range of high-quality homes, broaden home ownership opportunities, and create sustainable communities in the process.

3.4.13.3. Compliance Requirement

The NPPF document merely requires LPAs to "identify the size, type, tenure and range of housing that is required in particular locations, reflecting local demand". Hence, there is no specific spatial requirement recommended; this is left to the discretion of the local authorities.

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.21: National Planning Policy Framework Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
The NPPF sets out the Government's planning policies for England and how these are expected to be applied. The framework must be taken into account in the preparation of local and neighbourhood plans; and is a material consideration in planning decisions.	**Regulatory Function**	▪ The NPPF document to be used in the preparation of *locality plans* for local communities; a *viable mechanism* for making planning decisions
At the heart of the NPPF document is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking.	**Compliance Strategy**	▪ The overall theme of the NPPF document is *sustainable development* of the local

		communities and the entire country at large
For plan-making, LPAs should positively seek opportunities to meet the development needs of their area. For decision-making, LPAs approve development proposals that accord with the development plan.	**Compliance Responsibility**	▪ The LPAs are at the helms of *plan-making* and *decision-taking* affairs
Early engagement has significant potential to improve the efficiency and effectiveness of the planning application system for all parties. Good quality pre-application discussion enables better coordination between public and private resources and improved outcomes for the community.	**Collaboration**	▪ Early engagement at the pre-application stage improves the *effectiveness* and *efficiency* of the planning application system for all stakeholders
LPAs have a responsibility to provide an enabling and regulatory environment that delivers a wide choice of high-quality homes, widens opportunities for home ownership, and creates sustainable, inclusive and mixed communities. Responsibilities include planning for a mix of housing based on current and future demographic trends, market trends and the needs of different groups in the community; and identifying the size, type, tenure and range of housing that is required in particular locations, reflecting local demand.	**Market Consideration**	▪ Development of a wide range of high-quality homes to boost *home ownership* (end-users) and *profit-making* (the providers)
There are three dimensions to sustainable development: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles: economic, social, and environmental. Therefore, to achieve sustainable development, economic, social and environmental gains should be sought jointly and simultaneously through the planning system. The planning system should play an active role in guiding development to sustainable solutions.	**Policy Guidance**	▪ A comprehensive planning policy framework for *local plan development*, addressing the *spatial ramifications* of economic, social, and environmental change

3.4.14. GPF13: National Planning Practice Guidance (2014)

3.4.14.1. Regulatory Basis and Origin

This is to be used in conjunction with the NPPF (2014). The National Planning Practice Guidance (NPPG) sets out what the Government expects of the local authorities. The NPPG replaces over 7000 planning guidance pages, which is now available on the internet for public viewing.

3.4.14.2. Objectives of the Policy Framework

The overarching aim of this document is to ensure that the planning application system allocates land to be used for new build housing and job-creation purposes, protecting natural and historic assets.

3.4.14.3. Compliance Requirement

No compliance requirement stated.

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.22: National Planning Practice Guidance Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
The NPPF sets out the Government's planning policies for England and how these are expected to be applied. The framework must be taken into account in the preparation of local and neighbourhood plans; and is a material consideration in planning decisions.	**Regulatory Function**	▪ The NPPF document to be used in the preparation of *locality plans* for local communities; a *viable mechanism* for making planning decisions
At the heart of the NPPF document is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking.	**Compliance Strategy**	▪ The overall theme of the NPPF document is *sustainable development* of the local communities and the entire country at large
For plan-making, LPAs should positively seek opportunities to meet the development needs of their area. For decision-making, LPAs approve development proposals that accord with the development plan.	**Compliance Responsibility**	▪ The LPAs are at the helms of *plan-making* and *decision-taking* affairs
Early engagement has significant potential to improve the efficiency and	**Collaboration**	▪ Early engagement at the pre-application stage

effectiveness of the planning application system for all parties. Good quality pre-application discussion enables better coordination between public and private resources and improved outcomes for the community.		improves the *effectiveness* and *efficiency* of the planning application system for all stakeholders
LPAs have a responsibility to provide an enabling and regulatory environment that delivers a wide choice of high-quality homes, widens opportunities for home ownership, and creates sustainable, inclusive and mixed communities. Responsibilities include planning for a mix of housing based on current and future demographic trends, market trends and the needs of different groups in the community; and identifying the size, type, tenure and range of housing that is required in particular locations, reflecting local demand.	**Market Consideration**	▪ Development of a wide range of high-quality homes to boost *home ownership* (end-users) and *profit-making* (the providers)
There are three dimensions to sustainable development: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles: economic, social, and environmental. Therefore, to achieve sustainable development, economic, social and environmental gains should be sought jointly and simultaneously through the planning system. The planning system should play an active role in guiding development to sustainable solutions.	**Policy Guidance**	▪ A comprehensive planning policy framework for *local plan development*, addressing the *spatial ramifications* of economic, social, and environmental change

3.4.15. GSS14: Nationally Described Space Standards (2015)

3.4.15.1. Regulatory Basis and Origin

The rolling out of space standards is intended to streamline the myriad of space standards, local plans, supplementary planning guidelines, etc., into a single approach to provide a clear and consistent benchmark for developers when interacting with LPAs in England. This is the most recent space standard established by the English Government; it deals with the internal spaces within new dwellings and is relevant across all tenures.

3.4.15.2. Objectives of the Policy Framework

This benchmark sets out requirements for the GIA of new build houses at a defined occupancy level as well as floor areas and dimensions for essential parts of the house, viz., bedrooms, storage, lounge, storage, floor to ceiling heights

3.4.15.3. Compliance Requirement

The standard requires that:

- The flat/house provides at least the gross internal floor area and built-in storage represented in table below
- A flat/house with two or more bed spaces has at least one double bedroom
- In order to provide one bed space, a single bedroom has a floor area of at least 7.5m^2 and has at least 2.15m width,
- In order to provide 2 bed spaces, a double bedroom has a floor area of at least 11.5m^2, etc.

Tab.3.23: Minimum GIA and Storage (m^2) for NDSS

Number of bedrooms	Number of bed spaces	1 storey house	2 storey house	3 storey house	Built-in storage
1b	1p	39 (37)[2]			1.0
	2p	50	58		1.5
2b	3p	61	70		2.0
	4p	70	79		
3b	4p	74	84	90	2.5
	5p	86	93	99	
	6p	95	102	108	
4b	5p	90	97	103	3.0
	6p	99	106	112	
	7p	108	115	121	
	8p	117	124	130	
5b	6p	103	110	116	3.5
	7p	112	119	125	
	8p	121	128	134	
6b	7p	116	123	129	4.0
	8p	125	132	138	

N.B. Where a 1 person flat has a shower room instead of a bathroom, the floor area may be reduced from 39m2 to 37m2.

(STEPS 2 & 3: GENERATING INITIAL CODES & SEARCHING FOR THEMES)

Tab.3.24: Nationally Described Space Standards Compliance Themes

Data Extracts	Compliance Codes	Compliance Themes
In 2014, the Government undertook the Housing Standards Review to appraise how various local and national standards were being applied to new dwellings within England within the planning system. The review looked at practices relating to internal space; and consulted on streamlining the use of these standards via a single set of national standards, with the future prospect of importing the NDSS standards into the Building Regulations or a hybrid approach.	**Compliance Strategy**	▪ Focus on the identification of generally accepted requirements that would improve the existing space standards and frameworks used in England.
Minimum floor areas and room widths for bedrooms and minimum floor areas for storage are also an integral part of the space standard. The Gross Internal Area of a dwelling is defined as the total floor space measured between the internal faces of perimeter walls that enclose the dwelling. The Gross Internal Area should be measured and denoted in square metres (m^2).	**Compliance Requirements**	▪ The spatial requirement is the *minimum space standard.*
A fundamental aim of this guidance is to ensure that housing across the UK is flexible and accessible in use and adaptable over the life of a building. Housing should support family life, both in the flexibility and adaptability of homes and in the provision, in greater quantities, of larger homes	**Compliance Outcomes**	▪ The standards will improve the quality of life of residents, ensuring that new built homes are *spacious*, *decent*, and *adaptable* for a lifetime use by the resident.
The document established that when space standards are not strictly adhered to, there is no level of design expertise or criteria that would make small flats or houses much better or more habitable.	**Design Decision**	▪ The document operates on the policy that mandates that *no level of design expertise or criteria* can account for small flats or houses
In order to use the NDSS at the local level, an LPA must have a local plan policy requiring it. To adopt such a policy (and to apply it via planning conditions), the LPA has to demonstrate there is a clear evidenced need for the NDSS to be applied locally and consider the impact upon	**Political Motive**	▪ Hesitancy of Government of directly enforcing the spatial standards by giving the local authorities a chance to incorporate those standards into their local plan after due

viability within a Local Plan viability assessment.	consultations and housing needs viability tests.

3.4.16. Categorisation of Compliance Codes

Before proceeding to Step 4 (reviewing themes) of the thematic analysis process, it is thought that the compliance codes need to be sorted into their parent categories. The table below is a high-level representation of how the compliance codes, generated from the thematic analysis of policy frameworks and space standards, map into the categorised compliance codes. The emergence of categories from initial codes are illustrated in a data analysis mapping format found in the methodology chapter ahead.

Tab.3.25: Compliance Codes Summary of HSS and Policy Frameworks

Assigned Codes: Policy Frameworks/ Space Standards	**Compliance Codes**	**Categorised Compliance Codes**						
		Strategic Objectives (SO)	Responsibility (R)	Communication (C)	Technology (T)	Political Influence (PI)	Market Influence (MI)	Value (V)
GPF1: Tudor Walter (1919)	• Compliance Committee (R)		√					
	• Compliance Requirement (SO)	√						
	• Regulatory Function (R)		√					
	• Developmental Function (R)		√					
	• Market Consideration (MI)						√	
GPF2: Dudley Report (1944)	• Policy Guidance (SO)	√						
	• Construction Innovation (T)				√			
	• Compliance Requirement (SO)	√						
GPF3: Housing Manual (1949)	• Compliance Strategy (SO)	√						
	• Political Priority (PI)					√		
	• Market Response (MI)						√	
	• Compliance Requirement (SO)	√						
	• Policy Guidance (SO)	√						
GPF4: Parker Morris (1961)	• Design Decisions (R)		√					
	• Market Consideration (MI)						√	
	• Compliance Requirement (SO)	√						
	• Compliance Outcomes (V)							√
	• Construction Technology (T)				√			

GPF5: Housing Act (1985)	• Compliance Requirement (SO)	√						
PPF6: Lifetime Homes (1991)	• Compliance Committee (SO)	√						
	• Market Demand (MI)						√	
	• Compliance Requirement (SO)	√						
	• Priority (SO)	√						
PPF7: Guide to Standards & Quality (1998)	• Compliance Strategy (SO)	√						
	• Design Decision (R)		√					
	• Compliance Requirement (SO)	√						
PSS8: Gentoo Housing Group (2007)	• Compliance Strategy (SO)	√						
	• Policy Guidance (SO)	√						
	• Platform (C)			√				
	• Market Options (MI)						√	
GPF9: London Housing Design Guide (2010)	• Compliance Strategy (SO)	√						
	• Compliance Requirement (SO)	√						
	• Compliance Outcome (V)							√
	• Design Decision (R)		√					
	• Value-driven methodology (V)							√
GPF10: Homes & Communities (2010)	• Compliance Strategy (SO)	√						
	• Compliance Requirements (SO)	√						
	• Policy Guidance (SO)	√						
GPF11: Housing Quality Indicators (2011)	• Compliance Strategy (SO)	√						
	• Compliance Requirement (SO)	√						
	• Value-driven methodology (V)							√
GPF12: National Planning Policy Framework (2012)	• Regulatory Function (R)		√					
	• Compliance Strategy (SO)	√						
	• Compliance Responsibilities (R)		√					
	• Collaboration (C)			√				
	• Market Consideration (MI)						√	
GPF13: National Planning Practice Guidance (2014)	• Regulatory Function (R)		√					
	• Compliance Strategy (SO)	√						
	• Compliance Responsibilities (R)		√					
	• Collaboration (C)			√				
	• Market Consideration (MI)						√	
GSS14: Nationally Described Space Standard (2015)	• Compliance Strategy (SO)	√						
	• Compliance Requirement (SO)	√						
	• Compliance Outcomes (V)							√
	• Design Decision (R)		√					
	• Political Motive (PI)					√		
Occurrences		26	11	3	2	2	7	5
Percentages (%)		**46.4**	**19.6**	**5.4**	**3.6**	**3.6**	**12.5**	**8.9**

Tab.3.26: Categorised Compliance Codes and Occurrences

Ranking of Importance	Categorised Compliance Codes	Occurrences	%
1	Strategic Objectives	26	46.40
2	Responsibility	11	19.60
3	Market Influence	7	12.50
4	Value	5	8.90
5	Communication	3	5.40
6	Technology	2	3.60
7	Political Influence	2	3.60
Cumulative Total		**56**	**100%**

These results slightly differ from the previous literature review findings, as illustrated in Tab.2.2. For instance, in the literature review findings of compliance frameworks from other industries, it was found that *Communication* ranked highest; whereas, in the planning and housebuilding industry, the findings in Tab.3.26 above indicate that *Strategic Objectives* is the top-ranking category.

From the tables above, it is evident that the categorised compliance theme, *Strategic Objectives* is the compliance factor that is most significant and enjoys the greatest attention with 46.4%, hence sets the direction in influencing the coordination of compliance activities of spatial requirements for New Build Homes in England. The sub-themes include Compliance Requirement, Policy Guidance, and Compliance Strategy. The categorised theme, *Responsibilities*, accounts for 19.6% of the compliance factors; the sub-themes consist of Compliance Committee, Regulatory Function, Developmental Function, Design Decisions, Priority, and Compliance Responsibilities. The C*ommunication* categorised theme accounts for only 5.4% of compliance coordination of spatial requirements; the sub-themes comprise Platform and Collaboration. As clearly indicated in the table above, categorised themes of *Technology*, and *Political Influence* account for very low percentages of 3.6% each. This is interpreted to mean that these categorised themes have very subtle or low influences on the coordination of compliance activities of spatial requirements for New Build Homes in England. Technology sub-themes include Construction Innovation and Construction Technology; while

Political Influence sub-themes consist of Political Priority and Political Motive. Furthermore, the *Market Influence* categorised theme has a low value of significance, 12.5%, which indicates that it has a relatively low influence on the coordination of compliance activities for spatial requirements of New Build Homes. It contains sub-themes such as Market Response, Market Consideration, Market Options, and Market Demand; which need to be further explained. The categorised theme of *Value* accounts for 8.9% of compliance coordination significance. Its sub-themes are Compliance Outcomes and Value-driven Methodology. In terms of Value, spatial requirements or space standards alone are not a guarantee of housing quality, instead they should be supported by viable procurement methods and long-term management methodology (LDA, 2010).

(STEP 4: REVIEWING THEMES)

Tab.3.27: Summary of Compliance Factors Identified from Thematic Analysis of HSS and Policy Frameworks

Compliance Factors	Compliance Codes	Compliance Themes
• Strategic Objectives	• Compliance Requirement	• Setting regulations to define the spatial needs of council housing, which was represented in a table known as the Tudor Walter Requirements (GPF1) • A floor space requirement area of 83.6m^2 GIA for 3-bedroom – 2-storey houses (GPF2) • A floor space area of 92.9m^2 GIA for 3-bedroom houses; not a strict set of standards (GPF3) • Specification of floor area of 44.6m^2 for a 1-bed flat for 2 people (GPF4) • Established space metric is minimum floor areas for bedrooms (GPF5) • 16 design features/criteria were listed for new homes (PPF6) • Establishment of *activity-based requirements* for rooms and dwellings (PPF7) • The most significant of the housing requirements was the *minimum space standard* (GPF9) • Minimum space standard, measured in gross floor area (m^2) (GPF10) • Comprises the 10 indicators of the HQI tool (GPF11) • The spatial requirement is the *minimum space standard* (GSS14)

	• Policy Guidance	• Provision of guidance on housing design, site layout, housing density, typology, room size, building efficiency, etc. (GPF2) • Provision of guidance and best-practice examples (GPF3) • Provision of constant advice about various *housing options* to any *prospective buyer* of a new home (PSS8) • The manual derives from the Government's Decent Homes Guidance document (GPF10)
	• Compliance Strategy	• The need to develop more buildings to meet higher housing densities of the area (GPF3) • Identification of the amount of space required to allow rooms and houses to meet their functional purposes (PPF7) • Creation of *enabling* and *sustainable communities* in Sunderland (PSS8) • Focus on the identification of general requirements that would improve the *existing quality* of housing in London metropolis (GPF9) • The policy framework is tailor-made for social housing in England (GPF10) • The HQI tool is an assessment and measurement tool invented to allow existing or proposed housing developments to be assessed based on *quality* rather than cost (GPF11) • The overall theme of the NPPF document is *sustainable development* of the local communities and the entire country at large (GPF12) • The overall theme of the NPPG document is *sustainable development* of the local communities and the entire country at large (GPF13) • Focus on the identification of generally accepted requirements that would improve the existing space standards and frameworks used in England (GSS14)
	• Priority	• On *accessibility* and *convenience* of the new home for later life (PPF6)
• Responsibilities	• Compliance Committee	• Review of housing conditions (GPF1) • Recommendation that housing be state-subsidised with specific standards (GPF1) • Comprises a group of housing experts meeting together (PPF6)
	• Regulatory Function	• The LPA given the task of regulating the development of council housing for rent according to specified standards (GPF1) • The NPPF document to be used in the preparation of *locality plans* for local communities; a *viable mechanism* for making planning decisions (GPF12)

			• The NPPG document is used in conjunction with the NPPF as a viable mechanism for making planning decisions (GPF13)
		• Developmental Function	• The Housebuilder given the task of developing new council houses, adhering to the specified standard (GPF1)
		• Design Decisions	• Space standards were not enough to drive housing quality (GPF4) • *Usability factors* or functionality were major drivers (GPF4) • Improved effectiveness of designing sufficient space (PPF7) • Reflecting on issues of room shape, size, and window/door positioning (PPF7) • The document operates on the policy that mandates that no level of design expertise or criteria can account for small flats or houses (GPF9) • The document operates on the policy that mandates that *no level of design expertise or criteria* can account for small flats or houses (GSS14)
		• Compliance Responsibilities	• The LPAs are at the helms of *plan-making* and *decision-taking* affairs (GPF12) • The LPAs are at the helms of *plan-making* and *decision-taking* affairs (GPF13)
• Communication	• Platform		• A platform of openness, transparency, and fairness (PSS8) • An approachable service for new home lettings (PSS8)
	• Collaboration		• Early engagement at the pre-application stage improves the *effectiveness* and *efficiency* of the planning application system for all stakeholders (GPF12) • There is *due consultation* with the *local community* in developing the local plan (GPF13)
• Technology	• Construction Innovation		• Use of new technologies such as prefabricated and unconventional building methods (GPF2)
	• Construction Technology		• Effective space standards are not enough to achieve a standard design quality (GPF4) • Effective *site planning* and *precise construction* are highly recommended to achieve design quality (GPF4)
• Political Influence	• Political Priority		• Changing political prioritisation and shift of focus from housing *quality* to *quantity* (GPF3) • Heavy restriction on development land supply (GPF3)
	• Political Motive		• Hesitancy of Government of directly enforcing the spatial standards by giving the local authorities a chance to incorporate

		those standards into their local plan after due consultations and housing needs viability tests (GSS14)
• Market Influence	• Market Consideration	• Regulatory decision taken to not interfere with the products of the private housing sector driven by the forces of demand and supply (GPF1) • Sizes of houses are marketed by the number of bedrooms, not by floor space area (GPF4) • Development of a wide range of high-quality homes to boost *home ownership* (end-users) and *profit-making* (the providers) (GPF12) • Development of a wide range of high-quality homes to boost *home ownership* (end-users) and *profit-making* (the providers) (GPF13)
	• Market Response	• A call for the development of varieties of house typologies to give customers varied housing alternatives (GPF3)
	• Market Demand	• A large section of the population experienced a lack of *accessibility* and *convenience* in their new homes (PPF6)
	• Market Options	• Access to a high standard service that is responsive to *housing demand, choices*, and *household situations* by prospective home buyers (PSS8)
• Value	• Compliance Outcomes	• Adherence to the space standard is the starting point for *flexibility* and *adaptability* (GPF4) • The standards will improve the quality of life of residents, and ensure that new built homes are accessible, flexible, and adaptable for a lifetime use by the resident (GPF9) • The standards will improve the quality of life of residents, ensuring that new built homes are *spacious*, *decent*, and *adaptable* for a lifetime use by the resident (GSS14)
	• Value-driven Methodology	• Space standards on their own are no guarantee for quality (GPF9) • Standards must be supported by viable forms of *procurement* and long-term *management plans* (GPF9) • Development of a methodology for evaluating *housing quality* (GPF11)

The thematic analysis of policy framework documents forms a basis of developing a conceptual chart that generally explains the phenomenon of compliance factors influencing the adoption of spatial requirements for New Build Homes in England. It is reiterated here that the

complexity of the findings becomes the highlight of the study: that no single categorised code with a high frequency, such as *Strategic Objectives* or *Responsibilities* can wholly account for the phenomenon of compliance coordination problem. Instead, the problem could be understood as representing a complicated maze of influences, which include explanations of aspects of all seven categorised codes of *Strategic Objectives*, *Responsibilities*, *Communication*, *Technology*, *Political Influence*, *Market Influence*, and *Value*. The diagram below is a representation of the findings of the Thematic Analysis of selected documents in the planning and housebuilding sectors of the English housing industry.

Fig.3.2: Thematic Analysis Chart of Compliance Factors Derived from HSS and Policy Frameworks

The results of the Thematic Analysis above were used to refine the overall research question of the study, and to guide the ensuing interview questions for the performance of the interview studies. The table below is as illustrated:

Tab.3.28: Interview Questions Identified from Thematic Analysis of HSS and Policy Frameworks

Research Question	Interview Questions (IQs; n = 8)
What are the factors governing the compliance for spatial requirements of New Build Homes in England?	1. What *existing space standard* is adopted by your organisation for the compliance and coordination of spatial requirements of New Build Homes in your locale? 2. What are the compliance *strategic objectives* for implementing space standards in your organisation? 3. What are the *responsibilities* of all participants required for an effective coordination of [spatial] compliance activities in your organisation? 4. What are the *communication* methods or tools used for the compliance of space standards for New Build Homes? 5. What are the *technological* methods or tools used for the compliance of your space standard process and technology integration entail in your organisation? 6. What are the prevailing *political* influences surrounding the adoption of your chosen Space Standard for the development of New Build Homes in your locale? 7. What are the prevailing *market* influences surrounding the adoption of your chosen Space Standard for the development of New Build Homes in your locale? 8. What is the *value* derived in terms of benefits or outcomes from compliance of space standards for New Build Homes in your locale?

3.5. SUMMARY

The Housing Space Standards of a number of countries were comparatively investigated, together with the systems of Building Regulations and implementation. The countries investigated are Germany, Ireland, Australia, Norway, Sweden, Finland, Denmark, Scotland, Belgium, France, Netherlands, and the United Kingdom. The following findings were made:

- Studies indicated that the floor space standards in England are below the European average, making the English standards to be near the bottom of the range;
- In the England, space standards are expressed as gross floor area of the whole building or rooms; whereas, in the other countries, space standards are derived from functional criteria based on room usage;
- There is a larger difference between space standards in private and public procurements in England than elsewhere in Europe and the world;

- In other countries of Europe, apart from England, financial incentives or regulatory requirements promote space standards adoption;
- In other European countries, Planning and Building Regulation functions are combined into a single Building Permit, which includes the space standards for bedroom size and storage;
- The market trend in the European countries is to define dwelling size by floor area, however, in England, dwelling size is defined by the number of bedrooms.

Furthermore, over the century, efforts have been made to define minimum space standards in public sector housing delivery. The strategy has advanced steadily over the years, progressing through the following stages: Number of rooms (1919 Tudor Walters Report); Minimum floor space for bedrooms and the building as a whole (1961 Parker Morris/DB6 Standard); Functional/activity-based requirements (1991 Lifetime Homes & 1998 Guide to Standards & Quality); Quality indicators incorporating site features, building fabric performance and design quality (2011 Housing Quality Indicators).

From literature review, it was found out that the Parker Morris Report of 1961 is the most frequently cited benchmark for Space Standards among professionals in England and some other parts of the UK. However, the NDSS is beginning to gain grounds in the English planning and housebuilding sectors. A substantive theory in the form of a compliance chart representing all seven categorised codes (namely, *Strategic Objectives*, *Responsibilities*, *Communication*, *Technology*, *Political Influence*, *Market Influence*, and *Value*) for the coordination of compliance activities of spatial requirement for New Build Homes in England was presented. The results of the Thematic Analysis of policy frameworks were used to refine the overall research question, (*What are the factors influencing the compliance of spatial requirements for New Build Homes in England*?); and to guide the ensuing interview questions for the performance of the intended interview studies. Hence, Objective 2 of the research study was partly deemed to be achieved. The next chapter examines the thematic analysis of the semi-structured interviews conducted with local planning authorities, as the regulators of the planning and housing industry, with the aim of refining the research outcomes of the compliance factors influencing the adoption of housing space standards for NBHs in England.

CHAPTER 4
QUALITATIVE METHODOLOGY AND ANALYSIS

4.1. INTRODUCTION

This chapter explains the methodology used in the achievement of the objectives of this research study. It presents justification for the research design, the philosophical positioning, the methodology, the approach, and the methods adopted for this study. The chapter also covers the research flowchart, which encapsulates a critical review of literature, a thematic analysis of carefully selected policy frameworks, a thematic analysis of semi-structured interviews, a quantitative questionnaire survey to investigate the key compliance factors, and the development of a compliance chart of influencing factors of spatial requirements for New Build Homes in England.

4.2. RESEARCH DESIGN

Research design serves as a master plan that guides how the study has been conducted from the set of research objectives all through to the achievement of those objectives, and to the conclusion of the research (Thomas, 2010). Naoum (2012) explained research design to be an action plan for transiting from one stage of research to another. In a similar vein, Creswell (2009) asserted that research design entails the reviewing of literature to the data collection instruments and data analysis. Research design encapsulates everything needed to enhance the internal and external validity of the research study (Draper, 2004). According to Richards (2006), the onus of research design lies in the hands of the researcher, so that every phase of the research involving the planning of the research components, and also moving back and forth between collection of data and analysis of that data. Hence, in order to design a good piece of research, some knowledge of research paradigms is necessary (Draper, 2004).

4.2.1. Phase 1 – General Review of Existent Literature

To achieve Phase 1 of the study, a comprehensive *Literature Review* was adopted as secondary data, sourced from relevant academic journals, technical papers, and online materials, to provide understanding on terminologies such as compliance, compliance theory, regulatory compliance, corporate compliance, compliance framework, compliance factors, spatial

requirements, New Build Homes, and understanding on the global housebuilding industry. Tables were used to present the following findings:

1. Countries and their respective compliance approaches;

2. Countries and their Space Standard Metrics;

3. Scandinavian Countries' Gross Internal (Floor) Areas (GIA) Compared to England's NDSS.

4.2.2. Phase 2 – Thematic Analysis of Housing Space Standards and Policy Frameworks

To achieve Phase 2 of the study, a Thematic Analysis approach using the Braun and Clarke's 6-step process was employed. The documents examined were Government Policy Frameworks and Space Standards used in the English housebuilding industry. A table was used to present the Policy Frameworks/Space Standards used in England. The thematic analysis approach, like other qualitative research tools, mandates that data be scrutinised and decoded to draw out meanings and inferences, acquire understanding, and generate empirical knowledge (Corbin and Strauss, 2008). *Documents* provide background information as well as a historical context, illuminating the researcher's mind about the historical origin of the issues and conditions influencing the phenomenon being studied. Data obtained from *documents* can be used to contextualise data collected from interviews (Bowen, 2009).

Tables were used to present the following findings: *Data Extracts, Compliance Codes, and Compliance Themes*; *Compliance Codes Summary of HSS and Policy Frameworks*; *Categorised Compliance Codes and Occurrences*; and *Summary of Compliance Factors Identified from Thematic Analysis of HSS and Policy Frameworks.*

The primary data was analysed manually due to the number of documents examined. The *compliance factors* influencing the three key stakeholders in the regulatory compliance of space standards were abstracted from prior literature review, thematic analysis of HSS and Policy Frameworks, and thematic analysis of semi-structured interview studies.

4.2.3. Phase 3 – Thematic Analysis of Interview Studies

To achieve Phase 3 of the study, a critical evaluation of the *compliance factors* influencing the compliance of Housing Space Standard requirements for the English housebuilding industry

was identified. Out of the 3 key stakeholders of Local Planning Authority, Housing Associations, and House Developers, the LPA stakeholder was chosen at this stage because the primary oversight responsibilities of regulatory compliance and enforcement in the housebuilding industry, rests with the LPA (Carmona, et al., 2003). Hence, for this study, the LPA respondents were consulted to investigate the compliance problem of adopting housing space standards for New Build Homes in England.

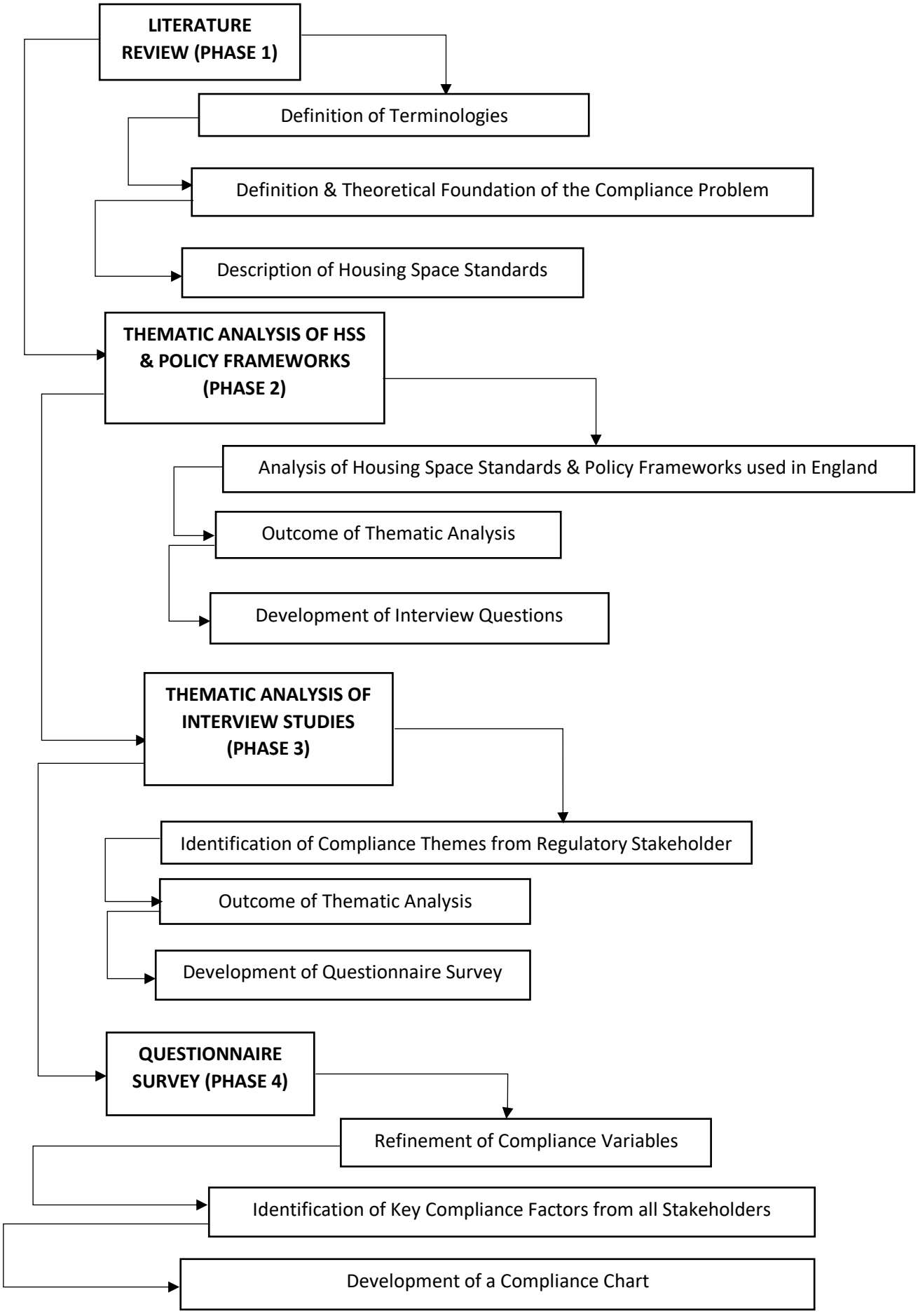


Fig.4.1: Research Design

4.3. RESEARCH PARADIGMS AND PHILOSOPHICAL DIMENSIONS

Easterby-Smith et al (2002) posited that it is unwise to undertake a research study without an understanding or perception of the philosophical themes that lie in the background. As part of the research design and methodology formulation, several research paradigms were studied to gain a comprehensive understanding of philosophical positions. The word *paradigm*, which originated from a Greek word *paradeigma*, is defined to mean a *pattern* that denotes a conceptual model of thinking established by a community of scientists to examine research questions and proffer answers to them (Thomas, 2010). Similarly, Fossey et al (2002) asserted that *paradigm* can be defined as a system of ideas, or conception of the world, adopted by scientists or researchers to create knowledge. MacKenzie and Knipe (2006) believed that *paradigm* has a great influence on the way knowledge is investigated and interpreted; and the choice of it informs the intention, motivation, and expectation from a research study.

These research paradigms are influenced by philosophical dimensions or branches known as: *Ontology, Epistemology, Axiology, Methodology* and *Rhetoric* (Furlong and Marsh, 2010; Creswell, 2012). Akehurst, *et al.* (2011) defined the ontological dimension of knowledge as the physical, technical, or social supports upon which, and in interaction with which, knowledge is created or founded. Essentially, *Ontology* asks the philosophical question, "What is the nature of reality? *Epistemology* is that branch of philosophy that is concerned with the study of scientific knowledge and its understanding; it asks the question, "What is the relationship between the researcher and the phenomenon studied?" *Axiology* asks the philosophical question, "What is the role of value and ethics in this study?" *Methodology* asks the question, "What is the process of research to gain new knowledge?" While the *Rhetoric* branch of philosophy asks the question, "What is the language of research, and how best can it be presented?" (Gunntilake, 2013).

According to MacKenzie and Knipe (2006), Lincoln, *et al.,* (2011) and Creswell (2013), there are a number of research paradigms that are closely associated with and inform research, these include: *positivism*, *post-positivism*, *interpretivism*, *social constructivism*, *transformative*, *emancipatory*, *critical realism*, *critical enquiry*, *pragmatism*, *participatory*, *advocacy*, etc**.** However, for the validation of theoretical postulations, Dash (2005) contends that *paradigm* can be broadly classified into *positivism* and *anti-positivism* (a sort of naturalistic inquiry). In a similar vein, it is widely and still currently debated that there are two broad, diametrically opposite, world views about the nature of knowledge, viz., *positivism* (which is generally

associated with quantitative research approaches) and *interpretivism* (which is generally associated with qualitative research approaches like this study) (Matt et al., 2006). Newman and Benz (1998) suggested that these two paradigms (*positivism* and *interpretivism*) could be conveniently placed as bipolar ends of a "paradigm continuum" of scientific enquiry, while the other *paradigms* (such as, *pragmatism, critical realism*, etc.) could be placed in between the wide *positivism-interpretivism* spectrum.

4.3.1. Positivism

Positivism is a philosophical concept, according to McNeil and Chapman (2006), which refers to a certain set of suppositions about the world and about suitable ways of investigating it. In a general sense, Positivists perceive the world as more important than the human being living in it, given that humans are born, assume a place in the society, and then eventually die, while the world continues to exist and remains unperturbed. Hence, this indicates that the world must tackle issues of sustainability that affect the people and the environment, caused by human activities. Therefore, for evidence of any sort to be obtained from the world, some empirical research (observation and measurement form the core of scientific endeavour) must be undertaken. This requires some real-world evidence in contrast to theoretical evidence based on analytical or abstract ideas (McNeil and Chapman, 2006). *(See Section 4.3.6 for the phase(s) of the research study where Positivism applies).*

4.3.2. Post-positivism

As earlier mentioned, for evidence of any sort to be obtained from the world, some empirical research (observation and measurement form the core of scientific endeavour) must be undertaken. This requires some real-world evidence in contrast to theoretical evidence based on analytical or abstract ideas (McNeil and Chapman, 2006). However, another school of thought was borne out of criticisms of positivism, which was Post-positivism. After the World War 2, Post-positivism replaced the Positivism school of thought (MacKenzie and Knipe, 2006). It was called *post-positivism* because it depicted the thinking after *positivism*, thus questioning the public perception of knowledge as absolute truth (Phillips and Burbules, 2000); maintaining that researchers cannot be supremely positive about their knowledge claims when human behaviours and actions are investigated (Creswell and Creswell, 2018).

Post-positivism is governed by a *deterministic* philosophical school of thought, which holds that all incidents, effects, and outcomes including human interactions and activities, are

ultimately determined by causes beyond our control; hence the problems examined by post-positivist researchers demand that the causes influencing the effects and outcomes, should be identified and evaluated (Creswell and Creswell, 2018). Thus, the compliance problem investigated in this post-positivist study indicates the need to establish and evaluate the causes influencing the adoption and compliance with housing space standards in England. Post-positivism also holds a *reductionist* school of thought such that ideas are reduced to small, distinct set of variables to test, which consists of research questions and hypotheses (Creswell and Creswell, 2018). The scientific knowledge that ensues from a post-positivist lens is founded on cautious scrutiny and evaluation of the factual reality of a thing existing "out there" in the world; hence the development of numeric scales of observations, and the study of human activities and interactions, are of prime importance in the work life of a post-positivist researcher (Creswell and Creswell, 2018).

Creswell and Creswell (2018) affirmed that the world is governed by theories, laws or principles, which need to be tested, verified, and possibly refined, to better understand the world. Therefore, the post-positivist approach to scientific methods of handling research begins with a theory, collection of data to validate or disprove the theory, and conduction of additional tests for improved adjustments (Creswell and Creswell, 2018). In conclusion, according to Creswell (2009), it was stated that Post-positivism embodies the conventional form of research by establishing ordinal scales of observations and predicting individual behavioural tendencies; hence, highly characteristic of a quantitative research approach (Guba, 1990; Creswell, 2009). *(See Section 4.3.6 for the phase(s) of the research study where Post-positivism applies).*

4.3.3. Interpretivism

Denzin and Lincoln (2005) asserted that *interpretivism, social constructivism* and *critical realism* paradigms are central to the qualitative research approach. The *interpretivism* school of thought suggests that individuals search for true meaning and understanding of the world they live and work (Creswell, 2009). Interpretivism is dependent on the respondents' perspectives of the phenomenon being investigated and acknowledges the influence of their background and experiences on the research being undertaken (Yates, 2004). According to Mc Neill and Chapman (2006), interpretivism is often an *inductive* type of research, that is, it does not usually commence with a theory (as the case with positivism or post-positivism that are *deductive* in nature – a type of research that stems from a theoretical basis), but a theory is generated or developed from a pattern of concepts or meanings during the research process.

The interpretivist researcher has a proclivity to rely on qualitative research approach of data collection methods and analysis techniques (Creswell, 2009). Interpretivism researchers usually address the "processes" of interaction among individuals, focusing on specific meanings of context in which people live and work in order to understand the social settings of the participants. In terms of practice, the questions posed in this kind of paradigm become broad and general so that participants can construct the meaning of a situation, according to Creswell (2012), a meaning characteristically forged in interactions with other participants, hence, the term *social constructivism*, a branch of interpretivism. This kind of researchers recognise that their own background shape their interpretation, and thus they "position themselves" in the research to appreciate how their interpretation flows from their own personal, cultural, social, and historical experiences. *(See Section 4.3.6 for the phase(s) of the research study where Constructivism applies).*

Hence, the researchers make an interpretation and construction of their findings, which are largely moulded by their own experiences and background. The researcher's objective is to make sense of, interpret, and construct the meanings others have of the world. Hence, the nature of this study suggests that some phases of it lies within the realm of interpretivism. *(See Section 4.3.6 for the phase(s) of the research study where Interpretivism applies).*

4.3.4. Advocacy, Participatory or Transformative

This research paradigm advocates that *Interpretivism* does not address social issues of justice and marginalised peoples (Thomas, 2010). *Advocacy, Participatory or Transformative* school of thought maintains that research investigation is inseparable from politics and political agenda, thus containing an action plan to influence and reform the lives of respondents, institutions, and the researcher as well (Creswell, 2009). Due to the social nature of this paradigm, it relies on qualitative research approach for data collection and analysis (Creswell, 2009).

4.3.5. Pragmatism

The *Pragmatism* paradigm gives researchers the flexibility to select the methods and procedures available to meet the research needs and purposes of their study. Pragmatism focuses on the *what* and *how* of the research problem, thus swinging the doors open for a combination of several worldviews, assumptions, data collection and analysis techniques, thereby making the mixed method research approach appealing to the *Pragmatist* researcher

(Creswell, 2009). *(See Section 4.3.6 for the phase(s) of the research study where Pragmatism applies).*

4.3.6. Research Paradigms and Philosophical Dimensions to the Study

As MacKenzie and Knipe (2006) stated that *paradigm* has a great influence on the way knowledge is investigated and interpreted; and the choice of it informs the intention, motivation, and expectation from a research study. From the previous sections of general overview of research paradigms, it seems portions of this research study share the attributes of paradigms such as post-positivism, social constructivism and interpretivism. Going by the aforementioned sections, it can be inferred that Phase 1 of the research study, which is about general literature review, has some elements of interpretivism in it. Phase 2 of the study, which is about the thematic analysis of housing space standards and policy frameworks, has core elements of interpretivism. Phase 3 of the study, which is about the thematic analysis of semi-structured interviews, also has core elements of social constructivism (a branch of interpretivism). While Phase 4 of the study, which is about the quantitative analysis of data gathered via questionnaire survey of respondent's views and perception regarding the compliance factors, has core elements of a post-positivist study.

However, on a wholistic level, the overall research paradigm of this study lies mainly in the realm of Pragmatism. This is so because, the pragmatist researcher is sometimes prone to relying on a combination of both qualitative and quantitative data collection and analysis methods – mixed methods (Creswell, 2009). Hence, the nature of this study suggests that it lies within the paradigm of pragmatism and its philosophical dimensions of ontology and epistemology as expatiated on below.

4.3.6.1. Ontological Dimension of Pragmatism to the Study

The ontological dimension of pragmatism for this study entailed the practice of adopting *singular* and *general terms* to pick out objects of knowledge as well as the use of existential claims regarding such objects. Ontological pragmatism asserts that singular and general terms have practical use criteria of specific words and sentences to provide characteristic attributes of the meaning and reference of numerical and ordinary object terms (such as the various terminologies used to understand and undertake this research study). This aided in providing answers to specific existential or research questions; and seeing how the meta-ontology (the

study of ontological issues of the compliance problem) or self-examination of things can be made to work in practice (Mitchell, 2018).

4.3.6.2. Epistemological Dimension of Pragmatism to the Study

The epistemological dimension of pragmatism for this study centred around the concept of *inquiry*, which involved the process of knowledge-seeking and how we can improve it (Legg and Hookway, 2019). This dimension of pragmatism combines *naturalistic questioning* with *naturalistic intuition*. Naturalistic questioning allowed the researcher to have a more traditional concern for conceptual and theoretical issues of compliance of spatial requirements for new build housing in England. While the naturalistic intuition enabled the researcher to trace the epistemological categories of compliance factors to their naturalistic roots. A synthesis of these two diverging needs empowered the researcher with creativity to propose and construct innovative solutions with his research study outcomes (Frega, 2011).

Furthermore, epistemological pragmatism helped the researcher to criticise and reconsider his view of the world of compliance in the housing industry by exercising the freedom to propose new *vocabularies*, which were systems of classification and description. These systems were the philosophical foundations upon which the emergence and re-ordering of compliance themes were conducted and evaluated to achieve the research aim and objectives of this study (Legg and Hookway, 2019).

Therefore, as earlier mentioned, the overall research paradigm of this study lies mainly in the realm of Pragmatism because the pragmatist researcher is sometimes prone to relying on a combination of both qualitative and quantitative data collection and analysis methods – mixed methods (Creswell, 2009). In the final analysis, this research study was conducted through the research paradigm of pragmatism, utilising a qualitative analysis approach, which included the combined use of preliminary literature review, thematic analysis of relevant technical documents, thematic analysis of semi-structured interviews, and a quantitative questionnaire survey, to address the research aim and objectives for the identification of compliance factors of adopting housing space standards for New Build Homes in England (Creswell, 2013; Owen, 2014).

4.4. RESEARCH METHODOLOGY

Research methodology is a systematic process of solving a research problem. This can be achieved by adopting different steps of studying the research problem (Crotty, 1998; Cooper, 2016). Generally, research approaches are classified into qualitative, quantitative, and mixed method strategies (Creswell, 2009; Naoum, 2012; Fellows and Liu, 2015). The philosophical assumptions reflect a specific decision that researchers make when they embark on which research strategy or approach to adopt whether qualitative or quantitative research strategy (Creswell, 2012).

For this research study, a Qualitative research strategy, of an exploratory nature, is most appropriate research approach because there is a need to: investigate the extent of the compliance problem of the housing sector in England; generate initial ideas about the phenomenon; and to test the practicality and potentiality of conducting a more comprehensive study regarding the phenomenon (Kumar, 2011). Also, it is an exploratory research study because the participants hold the expert knowledge relating to the study. In addition, Qualitative research approach seeks to explore and understand the meaning persons or groups attribute to a social or human phenomenon (Punch, 2005). The Qualitative process involves emerging questions and procedures in which data is typically collected in the respondent's setting; data is typically analysed inductively building from specifics to general themes; and the researcher makes interpretations of the meaning behind the data (Creswell, 2013). In this qualitative research, the researcher embraces the idea of multiple realities, as seen by the respondents in the study, with the intention of reporting the multiple realities. Evidence of different perspectives or realities consists of the use of quotes and themes in respondents' words arising from the findings (Creswell, 2012).

Fig.4.2: Overview of Methodology Flowchart

The Qualitative research approach comprises the following research methodologies – *narrative*, *phenomenology*, *ethnography*, *case study*, *grounded theory*, and *thematic analysis*; which all are often associated with the interpretivism school of thought (Petty et al., 2012; Creswell and Poth, 2017). However, these research methodologies are not applicable to this research study, except the *thematic analysis* methodology.

4.4.1. The Thematic Analysis Methodology

Thematic Analysis is the process that entails the identification of themes or patterns within any given qualitative data (Maguire and Delahunt, 2017). The objective of a thematic analysis is the identification of themes, i.e. interesting or relevant patterns in the data, and the use of these themes to address the research question. This is clearly beyond merely summarising the data; according to Maguire and Delahunt (2017), a good thematic analysis interprets, constructs, and makes sense of a given data.

According to Braun and Clarke (2006), thematic analysis should be the first of qualitative methods to be learnt as it provides fundamental skills, which are crucial for conducting many other types of qualitative analysis. Braun and Clarke attested that thematic analysis ought to be the underlying basis, method or methodology for qualitative analysis, since it furnishes the core skills needed to conduct many other forms of qualitative analysis. Other authors such as King (2004) and Nowell, et al (2017) have alluded to the fact that Thematic Analysis should be accorded a method or methodology in its own right. By virtue of its theoretical freedom, thematic analysis makes available for use a highly flexible approach, which can be reconstructed to suit the needs of many studies, thereby providing a rich, comprehensive and complex account of data (Braun and Clarke, 2006). King (2004) and (Braun and Clarke, 2006) also argued that thematic analysis is a useful methodology in examining viewpoints of various respondents, indicating similarities and differences, and producing unforeseen insights. Thematic analysis is also vital in summarising key attributes of huge data sets, since it compels the researcher to approach the handling of data in a systematic manner for the purpose of generating a clear and organised report at the end of the study (King, 2004).

Braun and Clarke (2006) affirmed that Thematic Analysis has been widely used in qualitative research; yet has not been accorded its due recognition in the same way Grounded Theory, Ethnography, Phenomenology, Case Study, etc., methodologies have been regarded. Thematic

analysis is usually not claimed as the method of analysis, when in actual fact, it is argued that many qualitative analyses are thematic in nature, thereby bearing other names as discourse analysis, content analysis, or not even identified as any method at all (Meehan, et al, 2000). Braun and Clarke (2006) argued that thematic analysis researchers do not necessarily have to subscribe to the implied theoretical commitments of Grounded Theory, if they are not intent on generating a full-blown grounded theory analysis. In contrast to grounded theory, interpretative phenomenological analysis, narrative analysis, discourse analysis or content analysis, Thematic Analysis is not restricted to any pre-existing theoretical framework, hence it could be utilised across various theoretical frameworks to accomplish various things within them, as long as there is a consistency in the determination of themes and analysis (Braun and Clarke, 2006). Thematic Analysis sometimes makes use of limited features of Content Analysis in the sense of allowing for quantitative analyses of its initial qualitative data (Ryan and Bernard, 2000). Additionally, thematic analysis can be used to transform qualitative data into a quantitative form that is later subjected to further statistical analyses.

Numerous ways of approaching Thematic Analysis exist, according to Alhojailan (2012); Javadi and Zarea (2016). But there is also a problem of differentiating the nature of thematic analysis from a qualitative content analysis due to their similarities (Vaismoradi, et al., 2013). In this phase of the study, Braun and Clarke's (2006) 6-step framework, which is possibly the most crucial approach in the social sciences, probably due to the fact that it provides a clear and functional framework for conducting a thematic analysis.

The **Braun and Clarke's 6-step framework of Thematic Analysis** is presented in below:

- **Step 1 – Familiarisation with Data**

Braun and Clarke's (2006) first step in any qualitative analysis is to read and re-read the data collected in whatever form it is {be it recorded observations, focus groups, texts from documents, multi-media files, public domain sources, policy documents, interviews, etc., (Thorne, 2000)}. The researcher should be very familiar with the entire body of the data and should jot down notes at the slightest impressions of themes and sub-themes as they emerge.

- **Step 2 – Generating Initial Codes**

At this phase, the researcher is meant to start organising the gathered data in a meaningful and orderly manner. It involves coding interesting attributes of the data in a systematic order across the whole data and gathering data relevant to each code. The art of coding reduces huge amounts of data into small, manageable units of meaning. Braun and Clarke suggested that there are various methods of coding, but the method will be informed by the researcher's perception and the research questions of the study.

- **Step 3 – Searching for Themes**

A theme, as earlier described, a theme is a pattern capturing something interesting and relevant to the research question of the study. It involves collating codes into their potential themes and gathering all data relevant to each potential theme.

- **Step 4 – Reviewing Themes**

At this phase, the researcher reviews, modifies and develops the preliminary themes that were identified in Step 3. Questions such as "Do they make sense?" arise. It involves checking if the themes work in tandem with the coded extracts and the entire data, thereby generating a thematic map of the analysis in the process.

- **Step 5 – Defining and Naming Themes**

According to Braun and Clarke (2006), this is the final refinement of the themes, and the aim of this phase is to identify the essence of what each individual theme is all about. Questions like these arise: "What is the theme saying", "Are there sub-themes?" "How do they relate to the main theme?" and "How do the main themes interact with one another?" This refines the specifics of each theme, and the overall story told by the analysis, resulting in clear names and definitions for each theme.

- **Step 6 – Producing the Report**

Usually, this involves the production of some kind of report or article describing the entire analysis process. It involves the selection of compelling data extract examples, analysis of selected extracts, relating back and forth of the analysis to the research question and literature review, and finally the production of a convincing report of the analysis.

4.4.2. Rationale for Selecting the Thematic Analysis Methodology

Braun and Clarke (2006) and Nowell, et al., (2017) agreed that Thematic Analysis is a qualitative research method that can be widely utilised across a range of epistemology and research questions. The Thematic Analysis Methodology (TAM) lies within the interpretivism paradigm with an ontological dimension of *relativism* and an epistemological dimension of *subjectivism* (Howard-Payne, 2016). The ontological dimension of *relativism* with respect to the TAM states that scientific data is influenced by the common consensus of a particular era, which is based on multiple perspectives concerning a particular phenomenon (Harry et al., 2005). For this study, a common consensus of government policy frameworks on housing space standards adopted within the period of 1918 and 2015 were consulted; and multiple perspectives from eligible respondents were interrogated on the compliance phenomenon. The epistemological dimension of *subjectivism* with respect to the TAM maintains that analysis of data and findings are as a result of construction by subjective understandings of the phenomenon being studied. The TAM allows for plurality and fusion of varying and contrasting categories underpinning the compliance problem in the planning and housing industry in England (Howard-Payne, 2016).

The TAM suggests the evolution of an inter-subjective relationship between the research and the researcher, so that an active interrogation of data gathering, and analysis is achieved. This methodology was adopted for this study because the researcher needed to immense self fully into the study, employing a great deal of reflection and conceptual thinking to analyse, categorise and diarise information coming from interview data (Howard-Payne, 2016). However, given the researcher's a *priori* knowledge of *compliance*, *compliance theory*, *compliance factors*, *spatial requirements*, *new build homes*, and the *housebuilding industry*, theoretically-deduced assumptions had already been gathered about the phenomenon of study; and that a partial review of literature is necessary before primary data collection and analysis is carried out (McGhee et al., 2007). For instance, the researcher had gathered from an earlier review of literature the likely core categories of compliance factors that may pose some influence on the adoption of Housing Space Standards for New Build Homes in England. However, in an effort to prevent the regurgitation of *a priori* assumptions in the emerging theory, the researcher conducted a thematic analysis of theoretically sampled housing space standards and policy frameworks, as well as a thematic analysis of in-depth, semi-structured interviews of professional respondents in the English housebuilding industry (Howard-Payne, 2016).

TAM affirms that the researcher can commence the research study having a preconceived research question in mind, which stems from a partial examination of existing literature (Melia, 1996). Hence, the TAM afforded the researcher to come up with the broadly conceived research question, "*What are the factors responsible for the coordination of compliance activities of spatial requirements for New Build Homes in England*?"

Given the points stated above, the researcher considered the TAM to be the most suitable qualitative methodology for analysing housing space standards and policy frameworks *(as demonstrated in the previous chapter)* and semi-structured interview studies *(as displayed in section 4.5 below)*, for the purpose of building a deeper understanding of the compliance factors influencing the adoption of housing space standards for New Build Homes in England.

4.5. PHASE 3 – THEMATIC ANALYSIS OF INTERVIEW STUDIES

4.5.1. Introduction

In achieving Phase 3 of the study, an awareness of the compliance theory enabled the researcher to ask the right questions needed to discover the heterogeneous and plural goals of regulatory compliance stakeholders through the thematic analysis of semi-structured interviews of respondents from the local planning authorities. Hence, a qualitative approach was needed to be adopted at this research stage because the research seeks to identify the compliance factors influencing the adoption of spatial requirements for New Build Homes; identify specific performance requirements, compliance protocols and priorities of Local Planning Authorities; and explore challenges, barriers, and opportunities encountered by Clients and Developers, regarding compliance processes and spatial requirements for English New Build Homes. Creswell (2013) affirmed that qualitative research is adopted when an issue or phenomenon is to be explored. Furthermore, Kumar (2014) stated that interviews were more suitable for collection of in-depth knowledge.

4.5.2. Preparing for the Interview Studies

The semi-structured interviews were conducted with 4 planning officials. This approach was taken to ensure that while high-level regulatory views were captured, developers' and end-

users' views in the housebuilding industry was reflected at a later stage of the research study. However, for the purposes of this stage, 4 individuals were contacted using in-depth semi-structured interviews. This was due to the fact that there were numerous building permits and planning application requests to be processed at the time of data collection. The researcher conducted further data collection so that a more robust research outcome will be obtained.

4.5.3. Data Collection

Bryman (2016) defines a *theoretical sample* as a term used to refer to *purposive sampling* conducted so that emerging theoretical considerations direct the choice of cases or participants until a point of theoretical saturation is attained. The participants were purposively chosen because they were the direct participants with the expert knowledge and understanding of the compliance coordination problem encountered by the planning and housebuilding sectors of the English housing industry. Theoretical sampling was used at this phase because participants interviewed were theoretically chosen to help the researcher best formulate the theory or conceptual model as an outcome of the research objective (Creswell, 2013).

High-level individuals in the Planning departments of Preston City Council, Fylde Borough Council were interviewed. Efforts were made to visit Blackpool City Council (the largest unitary authority in North West England), South Ribble Valley Council, Bolton City Council, Chorley Council, and Lancaster City Council, but the planning officials were not on hand to participate in the study. The designations of the participants interviewed were, Planning Policy Officer, Principal Planning Officer, Head of Planning Policy & Housing Strategy, Housing Standards (Team Leader).

4.5.4. Thematic Analysis and Findings of Interview Studies

When a researcher has completed the task of conducting interviews, the next step is to analyse what respondents have said in the interview sessions. It is imperative that the researcher goes through the data in a systematic manner (IDF, 2019). A systematic analysis also ensures that the researcher and his intended audience find it easy to understand precisely how conclusions were reached about the respondents, thereby enhancing the trustworthiness of the process (Lincoln and Guba, 1985). Lincoln and Guba refined the concept of trustworthiness by proposing that qualitative data analysis results should be *credible*, *transferable*, *dependable*,

and *confirmable*. This was developed in an effort to strengthen the qualitative criteria compared to its quantitative counterparts of *validity* and *reliability* (Lincoln and Guba, 1985).

Analysing interview transcripts takes time depending on the scale of the project or number of respondents. The importance of a properly analysed interview cannot be overemphasised, however, the method chosen primarily depends on the purpose of the study (IDF, 2019). IDF (2019) identified Thematic Analysis as one of the most common techniques of analysing semi-structured interviews. Hence, the Braun and Clarke's 6-step framework will also be used for the thematic analysis of the interview transcripts.

4.5.4.1. Step 1: Familiarisation with Interview Data

After the conduct of the interview studies, the interviews were transcribed, read and re-read to become familiar with the entire body of the data sets. Notes were jotted down at the instance of early meaningful impressions.

4.5.4.2. Step 2: Generating Initial Codes

At this stage, the researcher briefly described what was being said in the interview transcripts. So, any time the researcher noted something interesting in the data, a code was written down to describe the data item. The codes generated were basically descriptions, and not interpretations, which were meant to organise the entire data into meaningful groups.

Tab.4.1: Data Extracts from Interview Transcripts and Initial Codes

Data Extracts	Compliance Codes
Respondent 1: "Yeah, I would talk about planning in UK, I suppose, into three groups you got the *strategic planning* is what I do which is about this big question about *how many new houses we need to build over the next 15-20 years*."	Strategy
Respondent 1: "Very often, development is like lots of people tend to use small space, get the most out of a building, and the most out of the money they've put into it. And *it's my job, and Planning as well*, to push that back	Responsibilities

to say: 'No, these are the minimum standards we are going to adhere to."	
Respondent 1: "And then one of my team takes those plans, looks at them, measures the rooms, compares the layout, and makes a judgement about them."	Skills & Expertise
Respondent 1: "We provide a *feedback report* on compliance (that's back to the planning people). We provide that in a *written document*…"	Communication
Respondent 1: There is a *building regulation process* but what we have we only have it refined when a building comes in that needs our input, the building control, the administration team know that then that must be passed to us."	Process
Respondent 1: "What tends to happen after that stage is that we have an *automated process* when building controls see that we need to involve making sure that housing standards are right, we automatically get a referral from them."	Technology
Respondent 1: "I have read the NDSS when it was originally proposed in 2015, and I was surprised by it and I remembered reading Boris Johnson's comments…But again, that is adopted by local council, it's not a national legal document. Erm I thought at the time it was *highly aspirational* to go for that space standard."	Politics
Respondent 1: "Even in a small city like Preston, because the investment values are low so people need to get their maximum bank portfolio they want to make the maximum profit, the maximum income from the designs that they provide and to provide a 1-bedroom flat with that amount of space is a high target as far as I'm concerned."	Market
Respondent 1: "There will always be people who are flying the radar having no regard for compliance, having no regard for building regulations. And we have a very small proportion of people within the enforcement and we do it very regularly…For most people who recognise that we add *value* to what they are doing, it's a good relationship you know."	Value
Respondent 1: "In the modern Housing Act of 2004, what it says in terms of space	Benefits

standards of properties is that it must be *safe* and *healthy to live in*."

4.5.4.3. Step 3: Searching for Themes

The researcher at this stage started to sort out codes into themes. The codes represented interesting information in the interview data, while the themes were broader in perspective, and involved an elucidation of the codes and the data.

Tab.4.2: Compliance Codes and Themes

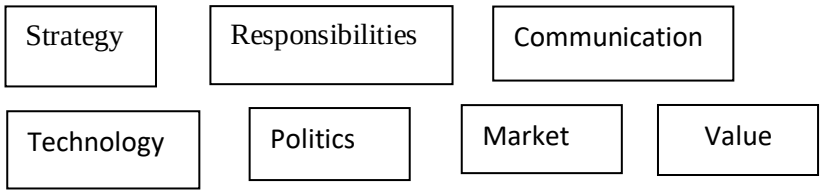
Compliance Codes	Compliance Themes
Strategy:	Compliance Requirements, Legal Requirement, Policy Guidance, Needs Assessment, Aspirational Goals
***Responsibilities*:**	Regulatory Function, Legal Function, Compliance Committee Stakeholder Involvement, Compliance Visit, Enforcement
***Skills & Expertise*:**	Design Decisions
***Communication*:**	Collaboration, Feedback Report
***Process*:**	Process Planning, Building Regulation Process, Compliance Levels, Compliance Checklist
***Technology*:**	Portable device (tablet), Level of Detail (3D model)
***Politics*:**	Degree of Government Involvement; Government Incentivisation
***Market*:**	Market Consideration, Market Options, Market Demand, Market Appeal, Investment Decisions, Land Space, Market Pricing, House Reproducibility, Housing Density, Market Preference
Value:	Economic Savings, Parity, Value accrued as a result of new technology or methodology
Benefits:	Client Satisfaction, Quality
***Stakeholder Adoption*:** Widespread acceptance of Standards, Uniformity of Standards	

Note: The codes are in italicised font. Each code contains, and is followed by, a theme or a set of themes, which are in Roman font.

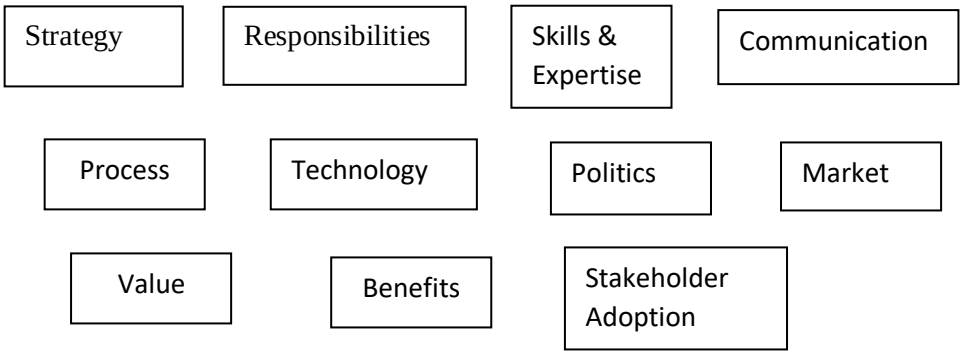
4.5.4.4. Step 4: Reviewing Themes

The researcher's next task is to review the themes. The crucial question asked at this stage is: "What are the embedded themes in the code categories of the study?" The themes were checked in relation to the coded extracts (Level 1) and in relation to the entire interview data set (Level 2), thereby generating a compliance code map and a checklist of compliance themes as shown below. Hence, the researcher began by ascertaining which categories were predominant in the interview data and outlining their content. Focusing on the respondents' views, the researcher found out 5 code categories (*Strategic Objectives*, *Responsibilities*, *Communication*, *Process*, and *Market Influence* categories) to be dominant due to the number of initial codes generated; *Market Influence* having the highest number of codes. The researcher decided to merge the *Responsibilities* and *Skills & Expertise* categories together because of their interrelationship; merge the *Process* and *Technology* categories together, based on the premise that the introduction of an innovative technology can engineer an existing compliance process; and also, the *Communication* and *Stakeholder Adoption* categories as they are closely tied together. The researcher reflected on the content and came to a decision about what constituted the main arguments within each category.

HSS & Policy Framework Codes:



Level 1: Initial Interview Codes in relation to Data Extracts



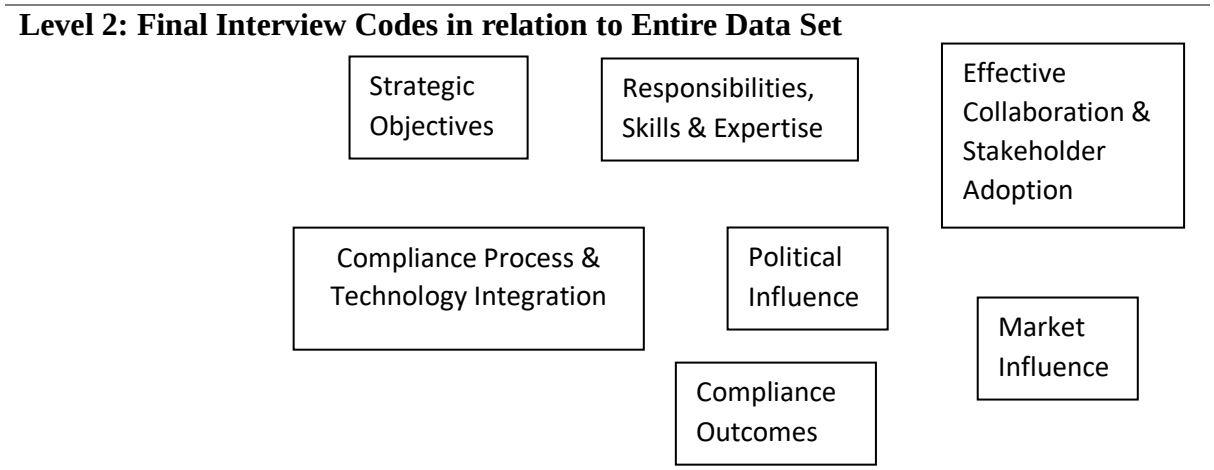


Fig.4.3: Compliance Code Map showing the Interview Study Findings

These arguments reflected the compliance themes governing the use of spatial requirements in the English housing industry, and are enumerated and further described in the chart below:

1. Strategic Objectives
2. Responsibilities, Skills & Expertise
3. Effective Collaboration & Stakeholder Adoption
4. Compliance Process & Technology Integration
5. Political Influence
6. Market Influence
7. Compliance Outcomes

Tab.4.3: Checklist of Compliance Themes Identified from Thematic Analysis of Interview Transcripts

Compliance Factors	Compliance Themes	1st Respondent	2nd Respondent	3rd & 4th Respondents
Strategic Objectives	Compliance Requirement	√	√	
	Legal Requirement	√	√	
	Policy Guidance	√	√	
	Aspirational Goals			√
	Needs Assessment		√	

Responsibilities, Skills & Expertise	Regulatory Function	✓	✓	✓
	Stakeholder Involvement	✓		
	Compliance Visit	✓	✓	
	Enforcement	✓		
	Design Decisions	✓		
	Compliance Committee	✓	✓	
Effective Collaboration & Stakeholder Adoption	Collaboration	✓		
	Feedback Report	✓		
Compliance Process & Technology Integration	Strategic Planning		✓	
	Building Regulatory Process	✓		
	Need Assessment		✓	
	Compliance Checklist			✓
	Compliance Levels	✓		
	Portable Device (Tablet)	✓		
	Level of Detail (3D model)		✓	
	Widespread Acceptance of Standards	✓		✓
	Uniformity of Standards	✓		
Political Influence	Degree of Government Involvement		✓	
	Government Incentivisa-tion		✓	
Market Influence	Market Consideration	✓	✓	
	Market Options	✓		
	Market Demand	✓		
	Market Appeal	✓		
	Investment Decisions	✓		

	Land Space		✓			
	Market Pricing		✓			
	House Reproduci-bility			✓		
	Housing Density			✓		
	Market Preference					✓
Compliance Outcomes	Economic Savings	✓				
	Parity			✓		
	Value derived from new methodo-logy or technology					✓
	Client Satisfaction	✓				
	Quality	✓				

4.5.4.5. Step 5: Defining and Naming the Themes

At this stage, the researcher names and describes each of the themes identified in the previous steps. In the describing a theme, the researcher highlights what is interesting about each theme, identifies what story the theme conveys, and how each story relates to other themes as well as in relation to the research question. The table below illustrates how each compliance theme tells a story in relation to other themes as well as to the research question.

Tab.4.4: Compliance Codes and Interview Themes' Definition

	Compliance Codes	Interview Themes
1.	Strategic Objectives	The space standards and technical housing documents set out the policy guidance for regulatory compliance of spatial requirements. Some of the documents used across interview participants included: • Housing Act of 1985 (Part 10), • The Modern Housing Act of 2004, • Environmental Health Policy, • Parker Morris Standard, and • National Planning Practice Guidance
2.	Responsibilities, Skills & Expertise	• The *Planning Team* gets a job or referral of plans and drawings, and then one of his team. • A *Case Officer* takes those drawings, examines them, measures the room, compares the layout, and makes a judgement about them.

		• The *Client* obtains a formal response from the team, which is then added to the planning process to make a decision whether to approve the building plan or not. • The *Planning Team* sends a response to the developer on its decision. • The *Developer* negotiates with the Planning Team to get the building to meet the standards. • The *Building Control Officer* conduct *compliance visits* to the site to check the building at different stages to ensure compliance at every stage till completion such that it could be checked if what was been built and completed meets the space standard set out at the beginning.
3.	Effective Collaboration & Stakeholder Adoption	• Communication is primarily via policy documents such as Government Technical Requirements, Local Plan Policy, and Supplementary Planning Guidance. • Consultations are also carried out between the regulatory bodies and the local community.
4.	Compliance process & Technology Integration	Existing technological tools used in the planning and housing sectors are: • Email, • Telephone, • Measuring Tape, • Digital Cameras, Printers, etc. to capture compliance violations, • 2D CAD and file-based collaboration.
5.	Political Influence	• There is also a general opinion that the new space standard is aspirational, having little chance of influencing New Builds because there are no incentives for Developers to adopt the standard. • There is currently no uniformity of Space Standards in the industry, despite government's efforts. A lack of uniformity causes the less economically viable cities to be places of less choice and investment.
6.	Market Influence	• The big problem is getting developers to comply with the standard, because they reduce the internal spaces of buildings to increase the building density on a specific location, so as to maximise profit.
7.	Compliance Outcomes	• There is a common misconception that the introduction of new technology is all about managing the process of constructing a building than using it for compliance and seeking for planning permission; and that there is no direct interface as yet between any new technology and the checking and planning application, as such, with respect to the NDSS.

4.5.4.6. Step 6: Producing the Thematic Report of Interview Findings

This step involves an analysis of data extracts from the interview transcripts, relating parts of the analysis to the literature. Liyanage (2014) affirmed that there are several techniques of analysing the interview findings:

- According to question-by-question basis;
- According to the research objectives;
- According to the research questions.

The question-by-question basis was adopted for this purpose, as follows. All 3 interviews were transcribed for analysis. The transcripts were then manually and thematically analysed, as there was no need to use a computer-aided qualitative analysis system such as QSR NVivo software. The Interview Questions are coded IQs; where n = 8; while the Respondents are coded R, where n=3.

According to IQ1, R1 responded that its *existing housing space standards* adopted by the organisation is derived from the Housing Act of 1985 (Part 10), which is explained earlier as GPF3. R2 responded that its organisation adopts the NDSS for its spatial requirements of New Build Homes but applies it "very loosely". R3 responded that its local planning authority applies a variety of planning policy documents, such as the National Planning Practice Guidance (NPPG) as the overall guiding document, and the GD7, H2, M43A local policy documents. The NPPG is explained earlier as GPF13. The Policy GD7 is the design policy that states that all new homes must comply with relevant design and optional standards. The Policy H2 specifies requirements for specialist accommodation for the elderly. The M43A document makes provision for accessibility and installation of wheelchair-user dwellings.

According to IQ2, R1 explained that the *policy guidance* of Housing Act of 1985 (Part 10) specifies minimum requirements for bedrooms effectively, mostly aiming at people's spaces inside their bedrooms, and setting clear guidelines per child, per adult, etc., known as bedroom standards. Before the adoption of the Housing Act of 1985, the spatial requirements used at the time served as case laws and *legal requirement* for the provision of sizes for parts of a dwelling, such as bedroom, bathroom, kitchen, lounge sizes, expected to be seen in planning applications tendered to the local authority. R1, however, noted that the *compliance requirement* for a one-bedroom flat is around $37m^2$, but around 24 – $25m^2$ floor area sizes were submitted to the planning department; with instances of very small kitchens of $3m^2$, bathrooms of $2m^2$, combined shower and toilet rooms of $2.5m^2$, lounges of $10m^2$, and about 10m2 floor areas for the one-bedroom. The respondent opined that it is a rarity to find developments in Preston that exceed those figures or requirements. R2 said that the NPPG sets the *policy guidance*, on how to aid proposals into plan, and determine plan applications by referencing the local plan to the NDDS requirements. On *compliance requirement*, R2 commented that the gross floor area for a one-bedroom flat is within the range of 35 – $37m^2$; while for a two-bedroom, two-storey house, the floor area is within the range of 90 – $100m^2$. In terms of government's *aspirational goals*, R2 posed a question, "Are the standards reflecting what is happening or the standards are trying to drive up what is happening in the housing industry?" suggesting that the goals

were too ambitious and unrealistic for the time being. R3 informed the researcher that the NPPG forms the basis of the *policy guidance* for the use of the GD7, H2, M43A local policy documents in their locale. Pertaining to *needs assessment*, R2 confirmed the fact that, as local planning authority, they are not mandated by the central government to impose the NDSS but should demonstrate its adoption according to evidenced needs and viability evaluation in the locale.

According to IQ3, R1 noted that most developers tend to economise on space, but it is the *regulatory function* of the planning authority to ensure that developers get the most out of a building, and the most out of the money invested, by adhering strictly to the minimum space standards. R2 responded that the case worker carries out the regulatory function, such that when plan applications come in, the case worker measures the space against the required standard; while the planning officer oversees the whole compliance checking process; and a senior planning officer makes the decision on planning application approval based on the size of the development. R3 noted that all requirements and criteria must be met for small and large developments. Regarding *stakeholder involvement*, R1 highlighted that even though there is an automated process, there is a need for stakeholders to be heavily involved to make sure that housing standards are right and adhered to. On the issue of *compliance visit*, R1 noted that compliance visits to the construction sites reduces the resources expended in adhering to a standard. R2 alluded to the same fact that as a property is being built, the building inspector from the building control department goes out in stages of development of a scheme, and checks if it is being built in compliance with regulations. On *enforcement* issues, R1 clarified that developers, clients, and the public are not scared of them, as they are simply doing their job; which entails getting together at the start of a project, agreeing on what is going to be built, usually fraught with a lot of contentions at that stage because people want to build "quite small" or "quite tight". But it is the duty of the local planning authority to say "NO" where necessary. R1 noted that the local planning authority in question had a set of *design decision/rules* (of minimum requirements) mostly centred on small flats, especially for new build homes or conversions. R1 and R2 responded similarly that the setting up of a *compliance committee* is necessary for any big developmental scheme. This planning committee oversees all aspects of the development and produces a lengthy report that sets out what type of property is being built, and all the details of the property. Hence, this committee can ask questions or seek further clarifications on the planning application of a proposed development tendered by the

developer; and reserves the right to refuse planning approval if developmental or compliance improvements are not strictly adhered to after the first stage of discussion with the developer.

According to IQ4, R1 emphasised on *collaboration* and the importance of a "very good relationship with lots and lots of developers, designers and architects and builders". Also, the planning and housing space standards departments work together on how standards could be complied with. On *feedback report*, R1 revealed that the housing space standards department provides a written feedback report on compliance to the planning department, which states how the planning status, spatial requirements, and certain elements of the building have been checked. R1 recounted an experience in which a developer/architect sent in a set of building plans, which were checked and approved; and a few months down the line, another version of the building plan was constructed on site. To forestall such an error, R1 suggested that the feedback reports ought to be in the digital form of an email, so that the version number of the building plan can be easily monitored and retrieved via smart phones and iPads, and not mistaken.

According to IQ5, R2 responded that *strategic planning* involves a forward-looking deliberation of how many new houses are needed over the next 15 – 20 years, which is based on demographics, household projections, housing typologies (a look at what type of houses, how many bedrooms, what sort of size of housing, etc., might be needed). R1 revealed that the local authority regularly gets appeals for different specifications; for instance, in a community comprised mainly of an ageing population, many people desire smaller houses or properties. Therefore, the planning department tends to match what might happen in the future with what is currently being built. However, there are other land uses for employment purposes that require bigger employment sites like the Red Scar site by the M6. On the sub-theme of *building regulation process*, R1 disclosed that sometimes there is no need for a planning application function to be conducted except when a building plan comes in that needs their input; otherwise only a building regulation/control function is necessary. The building control department knows when to pass the building plan to the planning department; and what happens is that within the building control process, when the work starts, they invite the planning department on site visits of decent-sized projects, conversion of a building to a large apartment building, conversion of a large HMO, and other big buildings, etc. There may be involvement at a few stages along the way due to revisions, but there is always a compliance visit at the end. So, at the end of the building regulation process, when everything is done and built, the housing

standards department is invited along to make sure that what has been built and completed meets the spatial requirements set out at the outset.

According to IQ6, in the opinion of R2, there is a low *degree of government involvement* in enforcing the NDSS, in the sense that the national space standards merely exist to reflect what is happening but not driving up the adoption rate. Hence, there are no changes in the types and sizes of new build homes. R2 lamented that the reason the standards are not influencing new builds is because there are no incentives for adopting the national space standards or changing from their current ways of building using old spatial requirements.

According to IQ7, R1 posited that at the start of a planning enforcement job, with the planning department and other stakeholders like the developers, designers, builders, etc, in participation, a *market consideration* is made where a consensus, of what is going to be built and how spatially compliant it should be, is reached. Sometimes, R2 noted, the big problem is getting developers to comply with the standards, as it depends on who's building it from a public housing perspective. Public developers like housing associations usually do not pose a resistance because they have the funding to build according to standards. Small builders or companies, however, struggle with the size of the properties because they try to maximise their capital by increasing the density on site, so they could sell more houses on one specific site. R1 emphasised that *market options* involve having an eye on whether a property is lettable, rentable, or saleable, based on what is required in the market. On *market demand*, R1 maintained that there must be a sustained demand for an owner to use a property and maintain it for a long time, otherwise the investment dips. R1 noted that buildings that were small and poorly designed had less *market appeal* and became a place of last resort for people who could not afford very good standard houses. R1 revealed that some *investment decisions* meant that some buildings are designed for the low-end of the market, while other buildings are designed for the high investment end of the market. In other words, the low-end investments violated the space standards, while the high-end investments accommodated the space standards in their designs because the client could afford it. R1 noted that *land space* affects the adoption of space standards; the more the land space available, the more the design inputs that go into it, which drives the cost of development higher. R1 responded that if the *market pricing* is set beyond the reach of customers or clients who are willing to buy or rent a new development in a city, they wouldn't buy into the property, and this would affect the investment; and ultimately, developers would begin to cut down on the space standards of new developments. Another way in which the adoption of space standards is adhered to by developers, R2 claimed, is *house*

reproducibility across the country. For instance, a developer designs and constructs a 4-bed detached house prototype and replicates it on various sites across the country; in that sense, the developer complies with the space standard in a more national way, rather than locally. R2 explained that *housing density* affects the implementation of space standards for new build homes in the sense that a higher density (i.e. more dwellings per hectare) would result in a higher ROI, which drives the developer to further lower the minimum spatial requirements.

According to IQ8, talking about *economic savings*, R1 pleaded with the public not to be wary of them, stating that the planning department exists to add value to stakeholders, by helping customers get it right from the outset, and saving them tons of money at the end. R1 introduced a *parity and quality* concept to the study, comparing Preston city with Manchester city. Preston competes a lot with Manchester in terms of pull factors such as university status, city size, commercial activities, etc., and as well as the space standards they set. R1 mentioned that in order to ensure that a city like Preston remains competitive and economically viable to invest, they've got to make sure that people investing in Preston are doing so with the same space standards as in Manchester, so that Preston does not become a place of lesser choice for investors. As it stands for investors, it is easier to develop in Manchester than in Preston, and recoup initial investment quicker. R2 and R3 agreed that the project management methodology could be utilised to derive greater value from the adoption of space standards for the housebuilding industry in England. R1 agreed that a good and healthy relationship is created amongst stakeholders when *client satisfaction* is achieved, paving way for more access to the new build housing market.

The diagram below is a representation of the findings of the Interview Studies:

Fig.4.4: Interview Studies Chart of Compliance Factors

Tab.4.5: Progression of Findings across the Research Process (Phases 1 – 3)

General Review of Literature	Thematic Analysis of HSS & Policy Frameworks	Thematic Analysis of Interview Transcripts
• Strategy • Responsibilities • Communication • Technology • Value	• Strategic Objectives • Responsibilities • Communication • Technology • Political Influence • Market Influence • Value	• Strategic Objectives • Responsibilities, Skills & Expertise • Effective Collaboration & Stakeholder Adoption • Compliance Process & Technology Integration • Political Influence • Market Influence • Compliance Outcomes

4.6. SUMMARY

The findings of the thematic analysis of housing space standards and the semi-structured interviews with local planning officials corroborate the earlier literature review's supposition that there was an overarching knowledge gap between the spatial compliance and the spatial quality in the planning system and housebuilding sectors of the housing industry in England. The tables above illustrate the gaps revealed across the seven compliance themes influencing the adoption of Housing Space Standards and Policy Frameworks in England. These compliance themes will be further investigated in the quantitative questionnaire survey phase of the research study in the next chapter. Hence, Objective 2 of the research study was fully deemed to be achieved.

CHAPTER 5

QUANTITATIVE METHODOLOGY AND ANALYSIS

5.1. PHASE 4 – QUESTIONNAIRE SURVEY

5.1.1. Introduction

This chapter presents the research concept, a list of research hypotheses, research methodology, empirical data analysis and interpretations. The survey goal is to investigate the key compliance factors influencing the adoption of space standards for New Build Homes in England; and verify the hypotheses from an empirical point of view. A carefully selected and systematic combination of quantitative techniques was used in this phase of the research study to identify the most influential factors affecting compliance with housing space standards for NBHs in England. The *Cronbach's alpha* technique will be applied to validate the reliability of each compliance factor of variables, and the entire questionnaire survey instrument. The *Relative Importance Index* technique will be applied to evaluate and rank the compliance factors. The *One-way ANOVA* tool will be utilised to accept or reject hypotheses of the correlation between each of the compliance factors against the selected criterion variable.

5.1.2. Research Hypothesis Statements

A research hypothesis is a hypothetical statement made by a researcher during speculation upon the possible outcomes of a research study or scientific experiment (Creswell and Creswell, 2018). A hypothesis is generated in several ways, but it is mostly achieved through an inductive reasoning process, where observations or inferences from data collected about a phenomenon, result in the formulation of a theory (Creswell and Creswell, 2018). However, to ensure that there are no deficiencies in the formulation of hypothesis statements, the researcher uses a string of inductive and deductive reasoning processes (O'Dwyer and Bernauer (2013). There are two types of hypothesis statements: The Null and the Alternative hypotheses; the Null Hypothesis (H_0) is a hypothesis that the researcher *first* attempts to refute or nullify, while the Alternative Hypothesis (H_1, H_2 …) is the researcher's perception of the real cause or reason behind a phenomenon (Kumar, 2014). The following hypotheses were generated based on prior and generic postulations, with further Compliance Factor findings that emerged from the research study of Spatial Requirements of New Build Homes (NBHs) in England:

- **H_0:** There is no positive correlation between Compliance Factors and Spatial Quality of NBHs in England;
- **H_1:** Strategic Objectives factor has a positive influence on the Spatial Quality of NBHs in England;
- **H_2:** Responsibilities, Skills & Expertise factor has a positive influence on the Spatial Quality of NBHs in England;
- **H_3:** Effective Collaboration & Stakeholder Adoption factor has a positive influence on the Spatial Quality of NBHs in England;
- **H_4:** Compliance Process & Technology Integration factor has a positive influence on the Spatial Quality of NBHs in England;
- **H_5:** Political Influence factor has a positive influence on the Spatial Quality of NBHs in England;
- **H_6:** Market Influence factor has a positive influence on the Spatial Quality of NBHs in England;
- **H_7:** Compliance Outcomes factor has a positive influence on the Spatial Quality of NBHs in England.

5.1.3. Research Variables of the Study

This research study presents empirical findings emanating from an unusual scarcity of information from secondary data sources information such as academic journals, textbooks, online databases, etc. However, the researcher managed to glean some relevant data from the following:

- Compliance practices from industries outside of the housing sector, such as financial, insurance, banking, health, government, non-profit, and self-regulatory organisations;
- A selection of UK Government and private sector policy framework documents containing information about various adoption and compliance practices of space standards for the English housing industry, from a historical perspective;
- A conduction of a qualitative semi-structured interviews with a few relevant housing stakeholders and professionals to clarify the compliance issues found from limited and scarce literature;

- A coordination of a quantitative questionnaire survey with a much wider audience of housing stakeholders and professionals to confirm the established compliance issues, and further investigate the most influential issues affecting the adoption and compliance of spatial requirements or standards for New Build Homes in England.

The need to bridge the compliance gap between spatial requirement and spatial quality in the English housing industry, culminated into the investigation of factors that influence the adoption of spatial requirements for New Build Homes in England. Hence, the research work presented in this section aims to:

1. Investigate the compliance factors listed in Table 5.1 below, thus evaluating the relative importance indices for each of them, after the collection of data from the questionnaire survey. This enquiry aims to raise the consciousness and draw the attention of housing stakeholders and professionals to the most significant, influential, and key compliance factors;
2. Investigate the perception of housing stakeholders and professionals on the concept of compliance factors of spatial requirements in the housing industry, via the inclusion of open-ended questions in the questionnaire survey;
3. Establish any relationships or correlations amongst the key compliance factors in an effort to grasp a deeper understanding of the internal compliance coordination problem;
4. Establish any relationships or correlations between the key compliance factors and the spatial quality of New Build Homes in England.

The various compliance factors involved in the study are enumerated in the table below, totalling 39 independent variables. *(Please refer to List of Acronyms)*:

Tab 5.1: List of Compliance Factor Variables for Adoption of Spatial Requirements

Compliance Factors	Variables
1. Strategic Objectives	1. Policy Frameworks for Development of NBHs 2. Regulations Defining Spatial & Activity-based Needs of NBHs 3. Strategic Planning of NBHs by Demography, Housing Typologies, Specification, etc. 4. Development of Guidance & Best Practice examples on Housing Design, Site Layout, etc.

	5. Provision of Housing Option Advice to prospective NBH buyers
	6. Identification of Space Required by Rooms/Houses to Meet Functional Needs
	7. Creation of Enabling & Sustainable Local Communities
	8. Focus on Identification of Generally Accepted Requirements to Improve Existing Space Standards
	9. Accessibility & Convenience of an NBH for Later Life
2. Responsibilities, Skills & Expertise	10. Setting up of Compliance Committee
	11. Review of Housing Conditions of a proposed NBH
	12. Regulation of NBHs by LPA
	13. Application of NPPF for Local Plan Development
	14. Housebuilder Decisions on Design Criteria, Usability Factors, etc.
3. Effective Collaboration & Stakeholder Adoption	15. A Platform of Openness, Transparency, & Fairness for Space Standards Adoption
	16. Early Engagement of Stakeholders for Planning Application System Enhancement
	17. Local Community Consultation for the Development of Local Plan & Space Standards
	18. Establishment of a Feedback Mechanism to Enhance Compliance Reporting Process
4. Compliance Process & Technology Integration	19. Application of New Technologies to Enhance Adoption of Space Standards for NBHs
	20. Effective Site Planning & Construction Techniques for Design Quality Enhancement
	21. Series of Compliance Visits to Ensure Space Standards Adherence
5. Political Influence	22. Political Support to Boost Housing Quality in terms of Space Performance
	23. Heavy Government Restriction on Land Supply for Sufficient NHB Development
	24. Government Hesitancy of Direct Enforcement of Space Standards
	25. Role of Government Incentives on Adoption Rate of Space Standards
	26. Permission to LPA to Adopt the NDSS & Other Space Standards
6. Market Influence	27. Public Influence on Housing Developers to Adopt Space Standards
	28. Stakeholder Consensus on Planning Enforcement & Space Standards Adoption
	29. Private Sector Interference of Regulatory Decision
	30. Marketing of New House Sizes by Bedroom Number
	31. Development of High-Quality Space Compliant NBHs Enhances Market
	32. Development of Housing Typologies Enhances Varied Customer Alternatives
	33. Development of Spatially Compliant NBHs Increases Profit for Housing Developers
	34. Reproducibility of Housing Typologies Enhances Space Standard Adoption

7. Compliance Outcomes	35. Space Standards Adoption Improves Residents' Quality of Life (Space, Accessibility, etc.) 36. Countrywide Adoption of Uniform Space Standards Enhances Equal Opportunities 37. Space Standards' Joint Adoption with Building Regulation & Other Standards Yields Better Benefits 38. Space Standards Support by Procurement & Management Plans 39. Development of Value-driven Methodology for Evaluation of Housing Quality

5.2. QUANTITATIVE RESEARCH METHODOLOGY

5.2.1. Quantitative Methodology

A critical exploration of the *compliance factors* the 3 key stakeholders, comprising LPAs, Housebuilders, and Client/Landlords was conducted using *Quantitative Questionnaire Survey* to empirically identify the key compliance themes influencing the spatial requirements for New Build Homes in England. Primary data was gathered via across all key stakeholders to draw more inferences and relationships from the data collection, compared to the prior interview study conducted with the LPAs (Silverman, 2013).

The research design in Fig 4.1 illustrates the steps and procedures implemented in the research design to achieve the aim of the research. It represents the formulation and execution of the research methodology and the essential research stages, such as research proposition, philosophical assumption, review of literature, collection of primary and secondary data, analysis of data collected, and expected outcome of research (Blaxter *et al.*, 2010).

Thomas (1996) defined questionnaire survey as a systematic process of collecting a group of cases such as individuals or organisations. Endut (2008) described questionnaire survey as comprising two core activities such as questionnaire development and data collection. Creswell (2009) asserted that a questionnaire survey is designed to provide a quantitative description of trends, tendencies, attitudes, positions, or judgements of a sample of the population, such that the researcher draws inferences or generalisations from the sample results to the whole population. However, according to Creswell (2009), the real intention of a questionnaire survey design is to test the effect of a treatment or investigation on an outcome, keeping all other factors that might influence the outcome constant.

In this research study, the questionnaire survey phase is aimed at achieving objective 4 of the study, which is to identify the key compliance mechanisms influencing the adoption of spatial requirements of New Build Homes in England. The research process in Fig 5.1 illustrates this phase.

5.2.2. Questionnaire Survey Design

The questionnaire survey is a popular instrument for data gathering and collection in any research activity involving human participants (Leman, 2010). Quite many reasons account for the widespread use of the questionnaire survey: its wide reach to a large community across geographical locations at a relatively affordable cost; data gathering from a large sample of the population; assurance of anonymity and confidentiality of respondents; recognition of techniques for coding and analysis of data from the early stage of questionnaire development (Bird, 2009). However, the questionnaire survey does not exist without its own limitations; Pickard (2008) and Bird (2009) identified some of these limitations as follows: evidence of poor response in comparison with other data collection techniques except administered in person; incapability of the researcher to influence or supervise the respondents' completion of the survey.

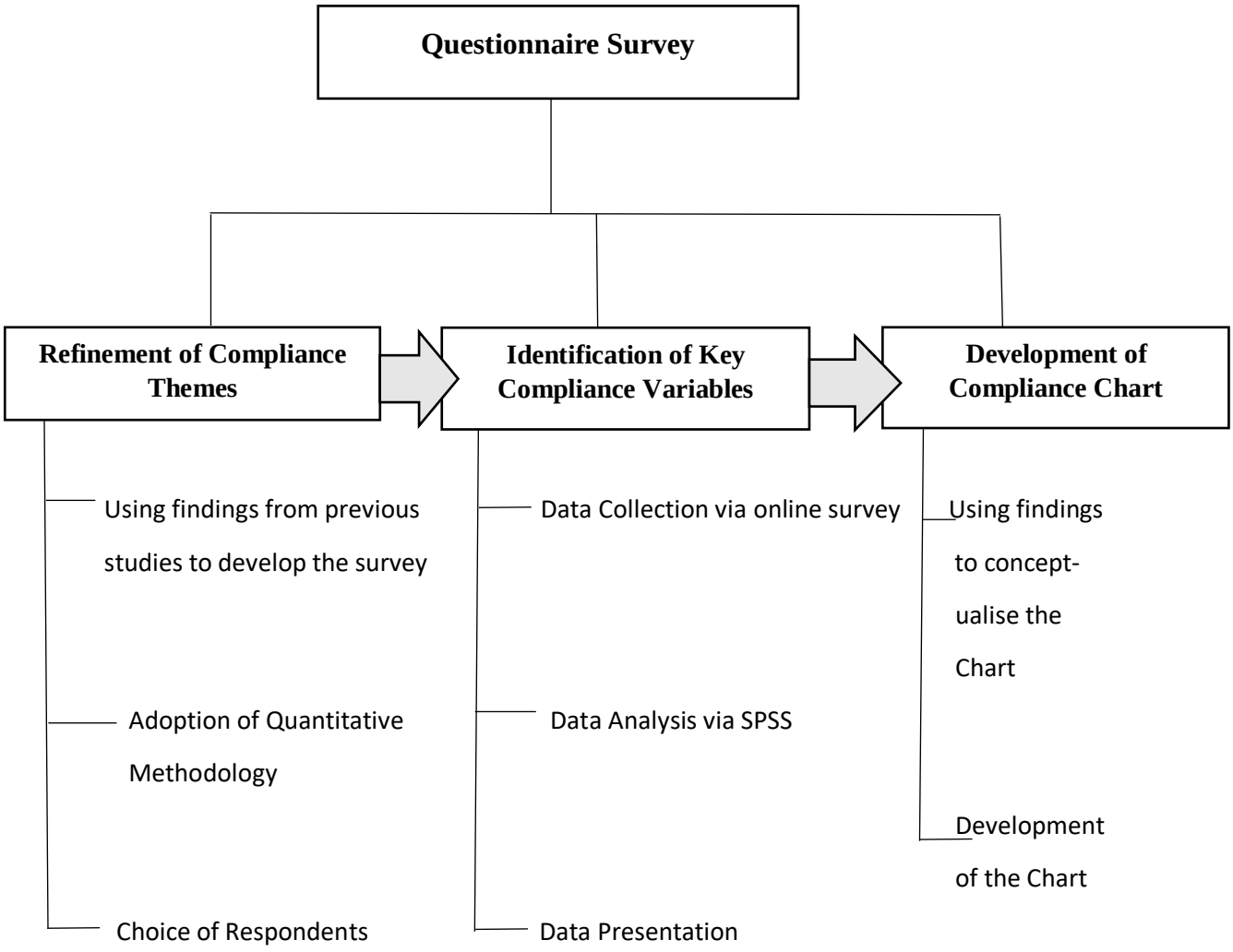


Fig 5.1: Questionnaire Survey Research Process

Clark-Carter (1998) proposed three formats for asking respondents questions: 1) Unstructured interviews, 2) Semi-structured interviews, and 3) Structured questionnaires. For this research study, the structured questionnaire is adopted because of the advantages it brings to the study which include (Clark-Carter, 1998):

- There is a clear idea of the range of likely answers the researcher wishes to explore or extract from the audience;
- There is an exact phrasing of questions in a certain order or some sort of scale such as the Likert scale of question;
- The fact that respondents could complete the questionnaires by themselves, saving the researcher copious and needless travel and interview time with each respondent;

- There is a definitive order or format that reduces the impact of a question on a respondent and how he or she responds;
- There is an allowance for an instant quantifiability of responses, for instance, questions could be quantified into a 4 or 5-level Likert scale.

5.2.3. Development of the Questionnaire Survey Instrument

The questionnaire survey was designed based on a combination of findings from a review of literature dealing with compliance factors in other industries outside of the housing industry, a thematic analysis of selected documents of policy frameworks and space standards in England, and a thematic analysis of semi-structured interview questions directed to regulatory bodies. The questionnaire consists of close-ended questions, soliciting for participants to choose from a set of alternatives (Krosnick and Presser, 2010), and open-ended questions, eliciting further responses from the respondent (Bryman, 2016). The questionnaire survey was introduced by a cover letter, and sent to local planning authorities, developers, clients, housing associations in England. The table below illustrates the systematic developmental process of the questionnaire survey instrument for the final collection of data:

Tab.5.2: Development Process of Questionnaire Survey Instrument

Categorised Variables for the Survey Instrument	**PHASE 2: Thematic Analysis of Housing Space Standards and Policy Frameworks**	**PHASE 3: Thematic Analysis of Interview Transcripts**	**PHASE 4: Resulting Survey Instrument from the Juxtaposition of Themes from PHASES 2 & 3**
Strategic Objectives	• Setting regulations to define the spatial needs of council housing, which was represented in a table known as the Tudor Walter Requirements (GPF1) • A floor space requirement area of 83.6m^2 GIA for 3-bedroom – 2-storey houses (GPF2) • A floor space area of 92.9m^2 GIA for 3-bedroom houses; not a strict set of standards (GPF3) • Specification of floor area of 44.6m^2 for a 1-bed flat for 2 people (GPF4) • Established space metric is minimum floor areas for bedrooms (GPF5) • 16 design features/criteria were listed for new homes (PPF6)	The space standards and technical housing documents used across participants were: • Housing Act of 1985 (Part 10), *(reference to GPF3)*; • Parker Morris Standard, (*reference to GPF4)*;	1. Policy Frameworks for Development of NBHs 2. Regulations Defining Spatial & Activity-based Needs of NBHs

• Establishment of *activity-based requirements* for rooms and dwellings (PPF7) • The most significant of the housing requirements was the *minimum space standard* (GPF9) • Minimum space standard, measured in gross floor area (m^2) (GPF10) • Comprises the 10 indicators of the HQI tool (GPF11) • The spatial requirement is the *minimum space standard* (GSS14) • Provision of guidance on housing design, site layout, housing density, typology, room size, building efficiency, etc. (GPF2) • Provision of guidance and best-practice examples (GPF3) • Provision of constant advice about various *housing options* to any *prospective buyer* of a new home (PSS8) • The manual derives from the Government's Decent Homes Guidance document (GPF10)		3. Strategic Planning of NBHs by Demography, Housing Typologies, Specification, etc. 4. Development of Guidance & Best Practice examples on Housing Design, Site Layout, etc.
• The need to develop more buildings to meet higher housing densities of the area (GPF3)	• The Modern Housing Act of 2004, (*reference to GPF3*);	5. Provision of Housing Option Advice to prospective NBH buyers
• Identification of the amount of space required to allow rooms and houses to meet their functional purposes (PPF7) • Focus on the identification of general requirements that would improve the *existing quality* of housing in London metropolis (GPF9) • The policy framework is tailor-made for social housing in England (GPF10) • The HQI tool is an assessment and measurement tool invented to allow existing or proposed housing developments to be assessed based on *quality* rather than cost (GPF11)	• Environmental Health Policy	6. Identification of Space Required by Rooms/Houses to Meet Functional Needs
• Creation of *enabling* and *sustainable communities* in Sunderland (PSS8) • The overall theme of the NPPF document is *sustainable development* of the local communities and the entire country at large (GPF12)		7. Creation of Enabling & Sustainable Local Communities
• The overall theme of the NPPG document is *sustainable development* of the local communities and the entire country at large (GPF13)	• Planning Practice Guidance, all of which fall short of the NDSS spatial requirement, (*reference to GPF13*).	

	• Focus on the identification of generally accepted requirements that would improve the existing space standards and frameworks used in England (GSS14)		8. Focus on Identification of Generally Accepted Requirements to Improve Existing Space Standards
	• On *accessibility* and *convenience* of the new home for later life (PPF6)		9. Accessibility & Convenience of an NBH for Later Life
Responsibilities, Skills & Expertise	• Comprises a group of housing experts meeting together (PPF6)	• The *Planning Team* gets a job or referral of plans and drawings, and then one of his team; • A *Case Officer* takes those drawings, examines them, measures the room, compares the layout, and makes a judgement about them. • The *Client* obtains a formal response from the team, which is then added to the planning process to make a decision whether to approve the building plan or not. • The *Planning Team* sends a response to the developer on its decision.	10. Setting up of Compliance Committee
	• Review of housing conditions (GPF1)		11. Review of Housing Conditions of a proposed NBH
	• The LPA given the task of regulating the development of council housing for rent according to specified standards (GPF1)		12. Regulation of NBHs by LPA
	• The NPPF document to be used in the preparation of *locality plans* for local communities; a *viable mechanism* for making planning decisions (GPF12) • The NPPG document is used in conjunction with the NPPF as a viable mechanism for making planning decisions (GPF13) • Space standards were not enough to drive housing quality (GPF4) • *Usability factors* or functionality were major drivers (GPF4)		13. Application of NPPF for Local Plan Development
	• The Housebuilder given the task of developing new council houses, adhering to the specified standard (GPF1) • Improved effectiveness of designing sufficient space (PPF7) • Reflecting on issues of room shape, size, and window/door positioning (PPF7) • The document operates on the policy that mandates that no level of design expertise or criteria can account for small flats or houses (GPF9) • The document operates on the policy that mandates that *no level of design expertise or criteria* can account for small flats or houses (GSS14)	• The *Developer* negotiates with the Planning Team to get the building to meet the standards.	14. Housebuilder Decisions on Design Criteria, Usability Factors, etc.
	• The LPAs are at the helms of *plan-making* and *decision-taking* affairs (GPF12)	• The *Building Control Officer* conduct *compliance visits* to the site to check the building at	

	• The LPAs are at the helms of *plan-making* and *decision-taking* affairs (GPF13)	different stages to ensure compliance at every stage till completion such that it could be checked if what was been built and completed meets the space standard set out at the beginning.	
Effective Collaboration & Stakeholder Adoption	• A platform of openness, transparency, and fairness (PSS8) • An approachable service for new home lettings (PSS8)	• Communication is primarily via policy documents such as Government Technical Requirements, Local Plan Policy, and Supplementary Planning Guidance.	15. A Platform of Openness, Transparency, & Fairness for Space Standards Adoption
	• Early engagement at the pre-application stage improves the *effectiveness* and *efficiency* of the planning application system for all stakeholders (GPF12)		16. Early Engagement of Stakeholders for Planning Application System Enhancement
	• There is *due consultation with the local community* in developing the local plan (GPF13).	• Consultations are also carried out between the regulatory bodies and the local community.	17. Local Community Consultation for the Development of Local Plan & Space Standards 18. Establishment of a Feedback Mechanism to Enhance Compliance Reporting Process
Compliance Process & Technology Integration	• Use of new technologies such as prefabricated and unconventional building methods (GPF2) • Effective space standards are not enough to achieve a standard design quality (GPF4)	Existing technological tools used are: Email, Telephone, Measuring Tape, Digital Cameras, Printers, etc. to capture compliance violations; 2D CAD and file-based collaboration.	19. Application of New Technologies to Enhance Adoption of Space Standards for NBHs
	• Effective *site planning* and *precise construction* are highly recommended to achieve design quality (GPF4)		20. Effective Site Planning & Construction Techniques for Design Quality Enhancement 21. Series of Compliance Visits to Ensure Space Standards Adherence

Political Influence	• Changing political prioritisation and shift of focus from housing *quality* to *quantity* (GPF3) • Heavy restriction on development land supply (GPF3) • Hesitancy of Government of directly enforcing the spatial standards by giving the local authorities a chance to incorporate those standards into their local plan after due consultations and housing needs viability tests (GSS14) • Recommendation that housing be state-subsidised with specific standards (GPF1)	• There is currently no uniformity of Space Standards in the industry, despite government's efforts. A lack of uniformity causes the less economically viable cities to be places of less choice and investment. • There is also a general opinion that the new space standard is aspirational, having little chance of influencing New Builds because there are no incentives for Developers to adopt the standard.	22. Political Support to Boost Housing Quality in terms of Space Performance 23. Heavy Government Restriction on Land Supply for Sufficient NHB Development 24. Government Hesitancy of Direct Enforcement of Space Standards 25. Role of Government Incentives on Adoption Rate of Space Standards 26. Permission to LPA to Adopt the NDSS & Other Space Standards
Market Influence	• Access to a high standard service that is responsive to *housing demand*, *choices*, and *household situations* by prospective home buyers (PSS8) • A large section of the population experienced a lack of *accessibility* and *convenience* in their new homes (PPF6) • Regulatory decision taken to not interfere with the products of the private housing sector driven by the forces of demand and supply (GPF1) • Sizes of houses are marketed by the number of bedrooms, not by floor space area (GPF4) • Development of a wide range of high-quality homes to boost *home ownership* (end-users) and *profit-making* (the providers) (GPF12) • Development of a wide range of high-quality homes to boost *home ownership* (end-users) and *profit-making* (the providers) (GPF13)	• The big problem is getting developers to comply with the standard, because they reduce the internal spaces of buildings to increase the building density on a specific location, so as to maximise profit.	27. Public Influence on Housing Developers to Adopt Space Standards 28. Stakeholder Consensus on Planning Enforcement & Space Standards Adoption 29. Private Sector Interference of Regulatory Decision 30. Marketing of New House Sizes by Bedroom Number 31. Development of High-Quality Space Compliant NBHs Enhances Market 32. Development of Housing Typologies Enhances Varied Customer Alternatives 33. Development of Spatially Compliant

	• A call for the development of varieties of house typologies to give customers varied housing alternatives (GPF3)		NBHs Increases Profit for Housing Developers 34. Reproducibility of Housing Typologies Enhances Space Standard Adoption
Compliance Outcomes	• Adherence to the space standard is the starting point for *flexibility* and *adaptability* (GPF4) • The standards will improve the quality of life of residents, and ensure that new built homes are accessible, flexible, and adaptable for a lifetime use by the resident (GPF9) • The standards will improve the quality of life of residents, ensuring that new built homes are *spacious*, *decent*, and *adaptable* for a lifetime use by the resident (GSS14) • Space standards on their own are no guarantee for quality (GPF9) • Standards must be supported by viable forms of *procurement* and long-term *management plans* (GPF9) • Development of a methodology for evaluating *housing quality* (GPF11)	• There is a common misconception that the introduction of new technology is all about managing the process of constructing a building than using it for compliance and seeking for planning permission; and that there is no direct interface as yet between any new technology and the checking and planning application, as such, with respect to the NDSS.	35. Space Standards Adoption Improves Residents' Quality of Life (Space, Accessibility, etc.) 36. Countrywide Adoption of Uniform Space Standards Enhances Equal Opportunities 37. Space Standards' Joint Adoption with Building Regulation & Other Standards Yields Better Benefits 38. Space Standards Support by Procurement & Management Plans 39. Development of Value-driven Methodology for Evaluation of Housing Quality

5.2.4. Measurement Scales

Newman (2006) observed that social science researchers make us of scales for reasons such as: usefulness in capturing the strength, or course of a variable construct; suitability for high coverage; tolerance for a high degree of reliability and accuracy; relatively easy comparisons between data sets; and assistance with simplifying data collection and analysis. According to Haughton and Stevens (2010) and O'Dwyer and Bernauer (2013), there are four scales of measurement incorporated by a questionnaire survey, namely: *nominal*, *ordinal*, i*nterval*, and *ratio* measurement scales.

A mixture of nominal and ordinal scales is utilised in this study. Nominal questions require participants to make a choice from the new build housing subsector, to which their

organisations belong, viz, owner-occupation providers, private renting providers, social renting providers, regulatory authorities, developers, etc. But these are broadly categorised into three key stakeholders: Local Authorities, Private Housebuilders, Registered Landlords/Housing Associations (Carmona et al. 2003).

5.2.5. The Likert Scale

Attitudinal investigation is a well-known aspect in survey research, Bryman (2016) affirmed. According to Bryman, the Likert scale – named after Rensis Likert, the developer of the research method – is one of the most widespread techniques for exploring attitudes and perceptions. The Likert scale is basically a multiple-indicator measurement of a grouping of attitudes connected to a common area of knowledge or activity (Bryman, 2016). The ordinal questions in this research study are designed on a 4-level Likert scale. More specifically, the Likert scale is a popular method of structured questionnaire for quantitative research because of the following attributes:

- Likert scales give respondents the freedom to select one of several degrees of perception about a question or statement; allowing for ranking of respondents at the end (Endut, 2008; Losby and Wetmore, 2012);
- Likert scales have gained credibility among social science researchers, and have been used for over half a century (Losby and Wetmore, 2012)
- Likert scales are easily constructible, and have a high degree of reliability and internal validity (Losby and Wetmore, 2012; Bryman, 2016);
- Likert scales apportion values from a group of items for each statement in the survey instrument (Losby and Wetmore, 2012; Bryman, 2016);
- Finally, Likert scales help in meeting the needs of researchers for data gathering of respondents' perception, perspective, reaction, or behaviour, by eliciting their response from a choice that best matches up with their viewpoint (Losby and Wetmore, 2012).

Therefore, respondents were asked to rate the key compliance coordination mechanisms influencing the adoption of spatial requirements for New Build Homes in England, based on a 4-level Likert scale of:

1. Not important
2. Somewhat important

3. Important
4. Very important.

5.3. DATA COLLECTION

This is the process of data gathering from stakeholders of private and public housing professionals in England such as, planners, owner-occupation providers, private renting providers, social renting providers, regulatory authorities, developers. But these are broadly categorised into three key stakeholders: Local Authorities, Private Housebuilders, and Registered Landlords/Housing Associations.

5.3.1. Identifying the Research Population and Sampling Unit

The **research population** comprises all full-time stakeholders of private and public housing stakeholders and professionals drawn from three main categories: Local Authorities, Private Housebuilders, and Registered Landlords/Housing Associations, situated in the geographical area of England. The aim of this research phase is to gather data from a sample of the research population, indicating that a sample is a selected set of elements of a population. Blaikie (2009) hypothesised that the ideal sample of a research population is a precise representation of that population of respondents in the sample, having important characteristics represented in exact elements or dimensions; though this is quite unrealistic. According to Odeyinka (2003), the importance of having a uniform and all-inclusive population sample was highlighted to collect reliable and sufficient data for the investigation of any research problem. Therefore, New Build Housing stakeholders and professionals in the public and private sectors in England, represent the *sampling unit* for this research study.

5.3.2. Sampling Strategy Adopted

There are essentially two broad classifications of sampling strategies: Probability sampling and Non-probability sampling classifications (O'Dwyer and Bernauer, 2013; Kumar, 2014; Bryman, 2016). At a glance, the Probability sampling category comprises the following (Blaxter, et al, 2010):

- Simple random sampling strategy – involves the selection of a sample element at random;
- Systematic sampling strategy – involves the selection of a sample element on every nth case;
- Stratified sampling strategy – involves the selection of a sample element within groups of the research population;
- Cluster sampling strategy – involves the surveying of a whole cluster of the research population sampled at random;
- Stage sampling strategy – involves the sampling of clusters of the research population sampled at random.

According to Blaxter, et al. (2010), the Non-probability sampling category consists of the following strategies:

- Convenience sampling strategy – involves the sampling of those elements most convenient for the research to undertake;
- Voluntary sampling strategy – here, there is a great deal of self-directed and self-selected sampling;
- Quota sampling strategy – involves the sampling of those groups of the population most convenient for the research to be conducted;
- Purposive sampling strategy – involves the careful selection of unique or interesting sample cases, with a purpose in mind;
- Dimensional sampling strategy – involves a multi-dimensional sampling of those convenient groups of population;
- Snowball sampling strategy – involves the gradual building up of a sample via the set of first-contact participants.

From the sampling strategies above, the *purposive sampling strategy* was adopted for the research study with a particular purpose in mind – a careful and unique selection of research participants who had the greatest likelihood of responding appropriately to compliance issues of housing space standards adoption for the development of New Build Homes in England. The Purposive sampling strategy was conducted by carrying out a comprehensive internet search of stakeholder organisations and professionals who were keenly involved with the adoption of housing space standards in England. The internet search revealed that some of these

organisations had recently published their own review document containing the needs and viability assessment of the proposed adoption and compliance of the NDSS requirements in their local communities. Some private sector organisations also published white papers and press releases about housing standards updates and the implications for housing development and the industry as a whole. Hence, it was logical to adopt these unique organisations as part of the sample size for the data collection.

5.3.3. Online Survey Method

There are several survey engines available online such as smartsurvey.co.uk, surveymonkey.com (the world's most popular online survey tool), surveygizmo.com, surveyplanet.com, zoho.com/survey, fluidsurveys.com, checkbox.com, keysurvey.co.uk, onlinesurveys.ac.uk, to name a few (ZiffDavis, 2018). It was found out that most of the online survey engines were mainly customised for commercial research for small-to-midsize businesses and large enterprises. However, among the pool of online survey tools found, only www.onlinesurveys.ac.uk stood out for the purpose of this research study, simply because it was specifically designed for academic research, education and the public-sector organisations. It was user-friendly, with no extra paid subscription made; fully compliant with UK data protection laws and accessibility requirements; and enabling collaborative working across organisations.

A test-run of the online survey, titled *Compliance Factors Survey*, was launched on the 12th February 2018, from which emails were sent on the platform to 239 respondents in the housing industry. By the 28th February 2018, the survey had expired with no single response, even with many reminders sent out subsequently; then the importance of follow-up via telephone calls was learnt. A new online survey was launched, titled *Housing Space Standards Survey* (the change in title was informed by one respondent who pleaded for missing the first survey launch), on the 3rd April 2018. A series of reminder emails were sent, together with telephone calls placed to each of the respondents. A few of the respondents declined that they never participated in surveys of any kind, whether for commercial or academic purposes; while a good number of respondents promised to complete the surveys in their most convenient times.

5.3.4. Postal Survey Method

Even with the researcher's quotidian dedication to making calls and sending reminder emails, they did not seem to be yielding desirable response rates. Hence, with just one and a half weeks to the online survey expiry date, the researcher embarked on a face-to-face delivery of hardcopies of the questionnaire surveys to clusters of respondent organisations located in the cities of North West England and parts of London metropolis. It was ensured that the hardcopy surveys were enclosed in self-addressed, stamped envelopes to be posted back to the researcher. Amazingly, the postal response rate was higher than the online response rate, such that out of 45 postal survey copies sent out, 14 hard copies were completed and posted back within one week; as compared to the 239 online surveys sent out, of which only 48 responses were captured by the online survey engine over a period of 7 weeks of intense telephoning and email reminders. Therefore, the combined survey efforts yielded a total of 62 respondents. The Table 5.3 illustrates the response rates in percentages, and the overall response rate of the combined questionnaire survey exercise.

Table 5.3: Questionnaire Survey Response Rates

Questionnaire Survey Method	Questionnaire Survey Planned	Questionnaire Survey Returned	Questionnaire Response Rate (%)
Online	239	48	20.08
Postal	45	14	31.11
Combined	284	62	21.83

There are several opinions suggesting the reasonableness of response rates for questionnaire surveys. For instance, Frankfort-Nachmias (1996) placed the typical response rate for surveys between the ranges 20 – 40%. While the study by Akintoye and Fitzgerald (2000) affirmed that the response rate for postal surveys is around 20 – 30% for the construction industry. Hence, going by these assertions, it is reasonable to conclude that the response rates of 20.08% (online survey), 31.11% (postal survey), and 21.83% (combined surveys) are valid for the research study.

5.4. DATA ANALYSIS

The data analysis software used for this phase of the study was the IBM SPSS Statistics, Version 24, which was utilised to code and analyse the survey data using descriptive and inferential analysis techniques. The analysis of data commenced by coding all missing data in the variable view of the statistical package with a number that could not have being an actual value or figure in the ordinal scale of perception, given that the actual Likert scale value was "4"; hence, the value "9" was appropriate, since it is recallable and could not be misinterpreted by the computer to mean any other thing than missing data (Bryman, 2016).

According to Blaikie (2003), a four-stage approach was deployed for the data analysis and presentation. The *first stage* is a descriptive univariate analysis of the nominal values of the questionnaire survey responses, measuring the central tendency of frequencies. The *second stage* is the use of Cronbach's alpha, a measurement of internal consistency or reliability of the ordinal scale of the survey responses. The *third stage* is the use of the Relative Importance Index (RII), to rank the order of influence of compliance mechanisms on new build housing developments. The *fourth stage* is the analysis of the research hypotheses using the F-test statistic, to test the significance of the multiple regression model of the predictive nature of compliance mechanisms on the outcome of spatial performance of new build housing developments (Blaikie, 2003).

5.4.1. Stage 1 – Frequency Distribution of the Data

A descriptive univariate analysis is the simplest form of data analysis of one variable at a single time interval; as a single variable, causal relationships are not illustrated, but rather a general description of data or patterns within the data (Bryman, 2016). According to Pickard (2008), *frequency distribution* is one of the earliest stages of analysing data, which involves calculation and presentation of datasets in frequency distribution table formats. A frequency distribution table presents the number of people or items and the percentage representing each of the categories for each variable under consideration (Haughton and Stevens, 2010; Bryman, 2018). Frequency distribution is relevant to this research study because it forms the basis for subsequent analysis of data, since the frequencies relate to the number of responses to each of the choices contained in every statement in the questionnaire survey (Pickard, 2008).

5.4.1.1. Respondents' Job Titles

This section addresses the first question in the questionnaire survey, "*What is your current job title*?" The question was a *single line free text* question, with no options to choose from; as a result, various job titles ensued, indicating the broad reach of the survey instrument across varied professionals and stakeholders of the planning and housing industry. Hence, this data cannot be represented by frequencies or percentages, however, respondents' job titles can be grouped in a tabular format as shown below:

Table 5.4: Respondents by Job Titles

Job Type	Specific Job Title	Occurrence
Planning & Housing Policy	Planning Team Manager / Planner / Planning Officer / Strategic Housing Officer / Strategic Housing Policy Officer / Housing Standards Team Leader / Apprentice Town Planner / Land & Planning Manager / Town Planner / Senior Planning Officer / Housing Enabling Officer / Planning Policy Team Leader / Planning Policy Officer / Housing Strategy Manager / Strategic Planning Officer/ Building Control Surveyor	16
Managerial	Head of Regeneration / Head of New Developments & Major Projects / Director / Construction Manager & Real Estate Practitioner / Project Manager / Chairman / Administrator / Managing Director / Consultant / Development Manager / Development Project Manager / Head of Development / Director of Growth / PFI Manager / Senior Project Delivery Manager / Principal Development Officer;	16
Housebuilding & Design	Architect & Head of Housing Research / Building Control Surveyor / Group Design Executive / Quantity Surveyor / Engineer / Architect / Land Surveyor / Installation Engineer / Architect & Director	9
Research & Innovation	Researcher / Research Associate	2

Clearly, as seen from the table above, a job title provides a strong indication about the respondent's level of job performance, responsibility, and experience. For each of the Planning & Housing Policy and Managerial job types, there were 16 different specific job titles; for the Housebuilding & Design job type, there were 9 different specific job titles; for the Research & Innovation job type, there were only 2 specific job titles. Hence, the data obtained from these respondents are considerably valid to meet the objectives and subsequent further analysis of the research study.

5.4.1.2. Respondents' City and Region in England

This section addresses the second question in the questionnaire survey, "*Which city and region of England are you based*?" Like the first, this question was a *single line free text* question, with no options to choose from; as a result, various city names and regions ensued, indicating the broad reach of the survey instrument across England. Hence, this data cannot be represented by frequencies or percentages, however, respondents' cities and regions can be represented in a tabular format as shown below:

Table 5.5: Respondents by Region and City

Region of England	City and County
Greater London	London / Kensington & Chelsea
South East	Chichester / Southampton / Hampshire / Surrey
South West	Bristol / Gloucester
West Midlands	West Midlands area
North West	Burnley / Blackpool / Manchester / Preston / Greater Manchester / Lancaster / Bolton / Oldham
North East	North East area
Yorkshire and the Humber	Bradford / Leeds / Sheffield / South Yorkshire
East Midlands	Leicester / Lincoln
East of England	–

From the table above, 8 out of 9 regions in England are fairly represented except in the region of East of England, where there is no respondent from that area. Hence, according to Blaikie et al (2010), for a small-scale research study of this kind, it could be safe to conclude that the research study is generalisable for the whole of England, and repeatable for any part thereof.

5.4.1.3. Sectors of Organisations in the New Build Housing Industry

This section addresses the third question in the questionnaire survey, "*How would you describe the sector of the new build housing industry your organisation is involved in*?" The question was a *multiple-choice single answer* question, with an "Other" option field for any other sector not listed. Hence, frequencies and percentages represent this data, as shown below:

Table 5.6: Respondents by Housing Sector

New Build Housing Sector	Frequency	Percentage (%)
Local Planning Authority	26	41.90
Private House Developer	18	29.00
Registered Landlord	2	3.20
Housing Association	9	14.50
Owner-occupier Provider	3	4.80
Private Renting Provider	0	0.00
Other	4	6.50
Total	**62**	**100.00**

The table above illustrates the New Build Housing organisations in six categorisations: Local Planning Authority (LPA), Private House Developer, Registered Landlord, Housing Associations, Owner-occupier Provider, Private Renting Provider, and Others. The LPA accounts for the highest percentage at 41.90%, which is partly due to the fact that it is the regulatory body of the planning and housing industry with a ubiquitous presence in almost every town, city, borough and metropolis; and also, because, in every LPA, there are at least 3 separate departments working together as one planning authority – there are the Planning Policy, Housing Standards, Housing Policy & Strategy, Building Control Surveying, and Environmental Health departments. The second largest sector is the Private House Developer,

with a percentage of 29.00%. This is also traceable to the fact that most house developer organisations are not very large corporations but small to medium-sized organisations with workforce of less than 250 employees, thus dotting the entire English landscape. The Housing Associations also enjoy a comfortable 14.50%, as they serve as the intermediary (buyer of housebuilding services) between the LPAs (the regulator of the housebuilding process) and the House Developer (seller of housebuilding services). From the data, it appears that the Housing Associations are roughly half the number of House Developers that exist in England.

However, Owner-occupier Providers, Registered Landlords, and Private Renting Providers account for a paltry 4.80%, 3.20%, and 0.00% respectively; this might be so because these organisations are classifiable under the broad category of Housing Associations, which also assume *provider* and *landlord* responsibilities. The Other New Build Housing sectors that constitute the 6.50% are Environmental Health Housing Standards Enforcement, Design Consultancy, Higher Education, and Research and Innovation departments or organisations.

5.4.1.4. Respondents' Years of Experience

This section addresses the fourth question in the questionnaire survey, "*How many years of experience do you have in new build housing industry*?" The question was a *multiple-choice single answer* question, with no "Other" option field. Hence, this data is represented by frequencies and percentages, as shown below:

Table 5.7: Respondents by Years of Experience

Years of Experience	Frequency	Percentage (%)
0 – 5 years	14	22.60
6 – 10 years	9	14.50
11 – 15 years	14	22.60
16 – 20 years	8	12.90
Over 20 years	17	27.40
Total	**62**	**100.00**

It turned out that the respondents with "Over 20 years" experience account for the highest percentage of 27.40% of highly experienced professionals due to a high occurrence of 16 managerial job titles from Tab.5.4. Categories "0-5 years" and "11-15 years" had a tie of 22.60%, which constituted a considerable population of early-career and middle-career professionals. Practitioners with "6-10 years" of work experience account for 14.50%, and professionals with "16-20 years" of experience account for the least percentage of 12.90%. In summary, the results indicate that about 62.90% of all the respondents have over 10 years of relevant work experience in the planning and housebuilding sectors of the industry, compared to the 37.10% of respondents that have below 10 years of work experience; as such it can be inferred that the respondents are well-qualified and highly experienced to provide valid and reliable perspectives on the phenomenon of compliance coordination problem in relation to the adoption of spatial requirements for New Build Homes in England.

5.4.1.5. Size of the Respondents' Organisations

This section addresses the fifth question in the questionnaire survey, "*How many employees are there in your organisation*?" The question was a *multiple-choice single answer* question, with no "Other" option field. Hence, this data is represented by frequencies and percentages, as shown below:

Table 5.8: Respondents by Number of Employees

Number of Employees	Frequency	Percentage (%)
1 – 50	17	27.40
51 – 100	5	8.10
101 – 200	6	9.70
201 – 500	13	21.00
Over 500	21	33.90
Total	**62**	**100.00**

The table above indicates that new build housing organisations differ in terms of size and number of employees. The result indicates that organisations with "Over 500" staff strengths accounted for the highest percentage of 33.90%; thus, it is assumed that the larger the size of

an organisation (in terms of number of employees, market dominance, and capital base, etc.), the more productive the organisation becomes, and the more reliable the data collected from such organisation would be. Organisations with staff strengths of "1-50" employees accounted for 27.40%; while organisations with staff strengths of "101-200" employees accounted for 21.00%. On the low percentages, organisations with "51-100" and "101-200" staff strengths accounted for 8.10% and 9.70% respectively; as such it can be inferred from the data that the organisations have a fair representation of all staff strength sizes. Furthermore, the results indicate that about 64.60% of all the respondents have over 101 employees in their organisations, compared to the 35.50% of respondents' organisations that have below 101 employees. Hence, it can be sensible to conclude that the varied staff strengths, coupled with the organisational statistic of 64.60% staff strength of over 101 employees, would positively influence the outcome of the research findings.

5.4.1.6. Compliance Rate of Housing Space Standards

This section addresses the sixth question in the questionnaire survey, "*What is the compliance and adoption rate of housing space standards in your organisation for new build housing developments*?" The question was a *multiple-choice single answer* question, with no "Other" option field. Hence, this data is represented by frequencies and percentages, as shown below:

Table 5.9: Respondents by Compliance Rate of Housing Space Standards

Rate of Compliance	Frequency	Percentage (%)
Very low	3	4.80
Low	8	12.90
Average	23	37.10
High	18	29.00
Very high	10	16.10
Total	**62**	**100.00**

The table above indicates that there is an average compliance rate of 37.10% with the housing space standards prior to the Nationally Described Space Standards (NDSS) released in 2015. These housing space standards are enlisted in Table 3.25. 29.00% of respondents thought that

their organisations' compliance rate was high; 16.10% of respondents were convinced that their organisations' compliance rate was very high; 12.90% of respondents believed that their organisations' compliance rate was low; and 4.80% of respondents held that their organisations' compliance rate was very low. In conclusion, the results indicate that a whopping 82.20% of respondents thought that their organisational compliance rate was average and above, which is highly encouraging for the research study findings. This strongly indicates that the respondents have a firm grasp of the concept of adoption, compliance, and experience in applying the housing space standards; hence, these respondents' familiarity with the compliance issues facing the industry.

5.4.1.7. Plan of Adoption for NDSS

This section addresses the seventh question in the questionnaire survey, "*Does your organisation currently adopt the Nationally Described Space Standards (NDSS) for the development of New Build Homes*?" The question was a *multiple-choice single answer* question, with no "Other" option field. Hence, this data is represented by frequencies and percentages, as shown below:

Table 5.10: Respondents by NDSS Adoption Plan

Adoption Plan	Frequency	Percentage (%)
No plans to adopt	9	15.30
Plans to adopt in the future	14	23.70
Yes	36	61.00
Total	**59**	**100.00**

The results revealed that 15.30% of respondents had *no future plans* of adoption of the NDSS. 23.70% of respondents have plans of adoption in place in terms of needs assessment, viability testing, and local plan development in tandem with the NDSS requirements. Amazingly, 61% of respondents said *yes*, and have already adopted the NDSS requirements for their housing developments in their areas of jurisdiction. There is an 84.70% probability or potentiality that the NDSS would be successfully adopted *in the near future*, which would translate to mitigation

of the compliance coordination problem, enhanced compliance rates of adoption, and delivery of high quality, spatially compliant New Build Homes in England.

5.4.2. Stage 2 – Reliability Analysis Test Using Cronbach's Alpha

Test of reliability in this context applies to the consistency or repeatability of a research instrument (Creswell and Creswell, 2018); the main issue is whether the indicators or measures that constitute the scale are consistent, such that respondents' scores on one measure approximate the scores on the other measures (Bryman, 2016). Reliability is the capacity of an indicator or measure to yield consistent outcomes; thus, such an indicator will be questionable if all or some of its elements are unreliable (Blaikie, 2003). According to Creswell and Creswell (2018), the most essential form of reliability for multiple-indicator instrument is its *internal consistency*, which is defined as the extent to which groups of indicators or measures in an instrument behave in identical ways. This is imperative, affirmed Creswell and Creswell (2018), because the instrument's scale of indicators should be considerably inter-correlated. Nowadays, due to advances in computing for quantitative data analysis, most researchers prefer to use the *Cronbach's alpha (α)* to quantify the internal consistency of their instruments' scale of indicators, with values ranging between 0 (indicating no internal reliability) and 1 (indicating a perfect internal reliability) (Bryman, 2016); and an acceptable Cronbach's alpha coefficient value of (α =0.70), at least (Creswell and Creswell, 2018). However, in the research experiment of Berthoud (2000), Berthoud concluded that a minimum level of (α = 0.60) is *good*.

Table 5.11: Cronbach's Alpha Values for the Data

	Compliance Factors Variables	Cronbach's Alpha Values (α)
1.	Strategic Objectives	0.892
2.	Responsibilities, Skills & Expertise	0.665
3.	Effective Collaboration & Stakeholder Adoption	0.801
4.	Compliance Process & Technology Integration	0.768
5.	Political Influence	0.741
6.	Market Influence	0.805
7.	Compliance Outcomes	0.782
8.	Questionnaire Survey Instrument	0.951

A reliability analysis test was conducted on each of the compliance factor variables as displayed above. The individual Cronbach's alpha values indicated that each section of the questionnaire survey attained reliability, with alpha values above the ($\alpha = 0.70$) standard: Strategic Objectives ($\alpha = 0.892$), Effective Collaboration & Stakeholder Adoption ($\alpha = 0.801$), Compliance Process & Technology Integration ($\alpha = 0.768$), Political Influence ($\alpha = 0.741$), Market Influence ($\alpha = 0.805$), and Compliance Outcomes ($\alpha = 0.782$). Furthermore, the only variable that was below the ($\alpha = 0.70$) value was – Responsibilities, Skills, & Expertise, with a value of ($\alpha = 0.665$). But there is a minimum value allowable by Berthoud (2000), to be ($\alpha = 0.60$); which means that the compliance variable of Responsibilities, Skills, & Expertise is *permissibly* reliable compared to the other variables. However, the computed Cronbach alpha value for all the compliance variables aggregated together yielded a high reliability of ($\alpha = 0.951$), suggesting that the measurements of scale applied, are very reliable in part and as an instrument, and that there is a great deal of internal consistency within the multiple-indicator instrument.

5.4.3. Stage 3 – Relative Importance Index of Spatial Compliance Factors

In an effort to empirically investigate the compliance factors and provide understanding of the extent of influence of each compliance factor on the adoption of spatial requirements for New Build Homes in England, both by itself and in relation with other compliance factors, the Relative Importance Index (RII) was utilised. Johnson and LeBreton (2004) highlighted that the RII assists the researcher in evaluating the input of a predictor or independent variable to the prediction of a criterion or dependent variable, both by itself and in relation to other independent variables. For a more detailed illustration, the RII values were calculated manually, the mathematical expression is stated below (Badu, et al. 2013).

$$RII = \frac{\sum W}{A * N}$$

Where, W = Weighting assigned to each compliance statement by the respondents, ranging

from 1 to 4 (1 = Not important… 4 = Very important);

A = Highest weighting (4 in this study);

N = Total number of respondents.

For instance, the RII for the first sub-variable, *Policy Frameworks for Development of NBHs* is computed below:

$$\frac{\sum [(1x3) + (2x6) + (3x35) + (4x18)]}{4 \times 62}$$

Hence, **RII = 0.778**

The table below provides a full list of the RIIs and the rankings of the spatial compliance factors for New Build Homes in England.

Table 5.12: Relative Importance Indices and Rankings of Compliance Factors

Compliance Factor Variables	1	2	3	4	W	RII	Rank
Strategic Objectives (SO)						**0.775**	**1**
Policy Frameworks for Development of NBHs	3	6	35	18	193	0.778	
Regulations Defining Spatial & Activity-based Needs of NBHs	4	8	32	17	184	0.742	
Strategic Planning of NBHs by Demography, Housing Typologies, Specification, etc.	4	7	23	28	199	0.802	
Development of Guidance & Best Practice examples on Housing Design, Site Layout, etc.	3	7	20	32	205	0.827	
Provision of Housing Option Advice to prospective NBH buyers	6	15	25	15	171	0.690	
Identification of Space Required by Rooms/Houses to Meet Functional Needs	4	4	25	28	199	0.802	
Creation of Enabling & Sustainable Local Communities	3	10	16	33	203	0.819	
Focus on Identification of Generally Accepted Requirements to Improve Existing Space Standards	3	12	27	18	180	0.726	
Accessibility & Convenience of an NBH for Later Life	1	9	27	24	196	0.790	
Responsibilities, Skills & Expertise (RS)						**0.765**	**2**
Setting up of Compliance Committee	17	14	15	15	150	0.605	
Review of Housing Conditions of a proposed NBH	6	21	21	13	163	0.657	
Regulation of NBHs by LPA	4	7	19	31	199	0.802	

Application of NPPF for Local Plan Development	4	5	30	23	196	0.790	
Housebuilder Decisions on Design Criteria, Usability Factors, etc.	9	13	20	17	163	0.657	
Effective Collaboration & Stakeholder Adoption (EC)						**0.742**	**3**
A Platform of Openness, Transparency, & Fairness for Space Standards Adoption	4	7	23	28	199	0.802	
Early Engagement of Stakeholders for Planning Application System Enhancement	2	10	22	28	190	0.766	
Local Community Consultation for the Development of Local Plan & Space Standards	6	13	18	24	182	0.734	
Establishment of a Feedback Mechanism to Enhance Compliance Reporting Process	12	11	21	17	165	0.665	
Compliance Process & Technology Integration (CP)						**0.732**	**4**
Application of New Technologies to Enhance Adoption of Space Standards for NBHs	10	17	19	16	165	0.665	
Effective Site Planning & Construction Techniques for Design Quality Enhancement	3	10	16	32	199	0.802	
Series of Compliance Visits to Ensure Space Standards Adherence	9	7	22	23	181	0.730	
Political Influence (PI)						**0.696**	**6**
Political Support to Boost Housing Quality in terms of Space Performance	7	6	20	28	191	0.770	
Heavy Government Restriction on Land Supply for Sufficient NHB Development	21	9	20	11	143	0.577	
Government Hesitancy of Direct Enforcement of Space Standards	12	10	24	15	164	0.661	
Role of Government Incentives on Adoption Rate of Space Standards	7	9	21	23	180	0.726	
Permission to LPA to Adopt the NDSS & Other Space Standards	4	13	21	23	185	0.746	
Market Influence (MI)						**0.671**	**7**
Public Influence on Housing Developers to Adopt Space Standards	9	15	24	12	159	0.641	
Stakeholder Consensus on Planning Enforcement & Space Standards Adoption	5	12	19	24	182	0.734	
Private Sector Interference of Regulatory Decision	7	13	27	12	162	0.653	
Marketing of New House Sizes by Bedroom Number	15	16	22	7	141	0.569	
Development of High-Quality Space Compliant NBHs Enhances Market	4	12	25	18	175	0.706	
Development of Housing Typologies Enhances Varied Customer Alternatives	5	7	25	24	190	0.766	
Development of Spatially Compliant NBHs Increases Profit for Housing Developers	11	15	20	14	157	0.633	
Reproducibility of Housing Typologies Enhances Space Standard Adoption	9	12	23	16	166	0.669	
Compliance Outcomes (CO)						**0.720**	**5**
Space Standards Adoption Improves Residents' Quality of Life (Space, Accessibility, etc.)	4	9	17	31	197	0.794	

Countrywide Adoption of Uniform Space Standards Enhances Equal Opportunities	7	12	23	18	172	0.694
Space Standards' Joint Adoption with Building Regulation & Other Standards Yields Better Benefits	4	7	21	29	197	0.794
Space Standards Support by Procurement & Management Plans	7	15	25	13	164	0.661
Development of Value-driven Methodology for Evaluation of Housing Quality	8	14	25	13	163	0.657

The chart below illustrates the high-level illustration of ranking and relative importance indices of the compliance factors influencing the adoption of spatial requirements for New Build Homes in England.

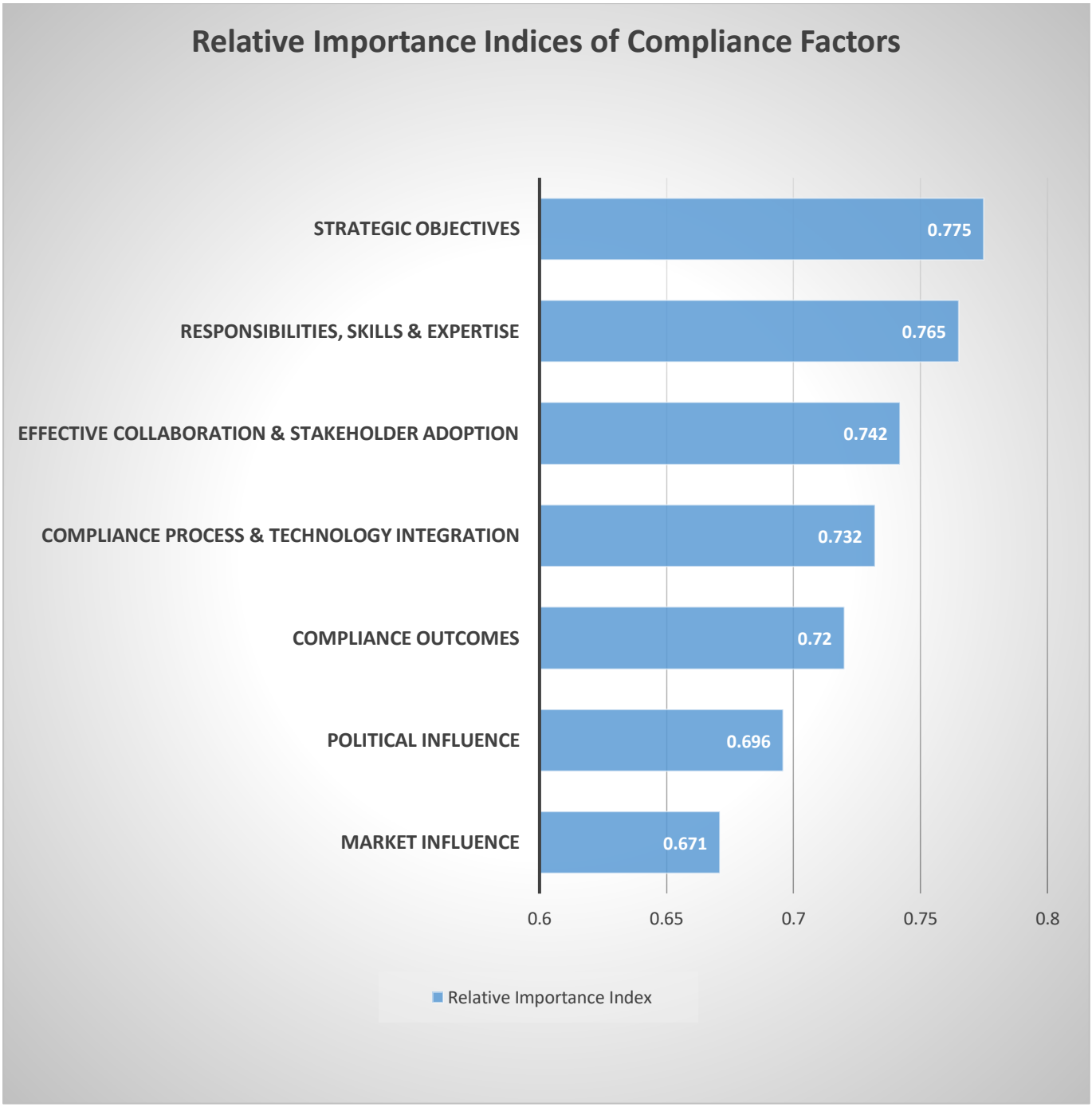


Fig.5.2: The Compliance Factors Chart

Tab.5.13 below presents the low-level illustration of relative importance indices and rankings of the 39 compliance sub-variables of spatial requirements of New Build Homes in England. However, before listing the sub-variables and their rank positions, it is worth mentioning that some sub-variables had the same RII values, therefore the strategy adopted for ordering the sub-variables with same RII values include the following considerations:

- If the RII value of any given parent factor of a sub-variable is higher than the RII value of the next sub-variable's parent factor, then the sub-variable with the higher parent factor RII will take precedence. For instance, the *5th*, *6th* and *7th* sub-variables all have the same RII values, however, the RII values of the parent factors (*Responsibilities…*, *Effective Collaboration…*, *Compliance Process…*, respectively) were used to rank the sub-variables accordingly (*See Fig.5.2*).
- If any given two sub-variables having the same RII values (such as the *3rd* and *4th* sub-variables) happen to belong to the same parent factor (in this case, *Strategic Objectives*), then the thematic order of emergence of sub-variables as gleaned from Tab.5.2 was used to rank the RII values of sub-variables accordingly as shown in Tab.5.13.

The 1st-ranking sub-variable is *Development of Guidance & Best Practice examples on Housing Design, Site Layout, etc*. with (RII = 0.827). The *Creation of Enabling & Sustainable Local Communities*, a *Strategic Objective* sub-variable, is the 2nd-ranking sub-variable with (RII = 0.819). Another *Strategic Objective* sub-variable, *Strategic Planning of NBHs by Demography, Housing Typologies, Specification, etc.*, is the 3rd-ranking sub-variable with (RII = 0.802). It is evident from the table that the first four sub-variables belong to the *Strategic Objectives* category; hence, the 4th-ranking sub-variable is *Identification of Space Required by Rooms/Houses to Meet Functional Needs* with (RII = 0.802). The 5th-ranking sub-variable, and the first sub-variable in the *Responsibility, Skills & Expertise* category, is *Regulation of NBHs by LPA*, with (RII = 0.802). The 6th-ranking sub-variable, and the first sub-variable in the *Effective Collaboration & Stakeholder Adoption* category, is *A Platform of Openness, Transparency, & Fairness for Space Standards Adoption* with (RII = 0.802). The 7th-ranking sub-variable, and the first sub-variable in the *Compliance Process & Technology Integration* category, is *Effective Site Planning & Construction Techniques for Design Quality Enhancement* with (RII = 0.802). The 8th-ranking sub-variable, and the first sub-variable in the *Compliance Outcomes* category, is *Space Standards Adoption Improves Residents' Quality of Life (Space, Accessibility, etc.)* with (RII = 0.794). The 9th-ranking sub-variable, and the second sub-variable in the *Compliance Outcomes* category, is *Space Standards' Joint Adoption with Building Regulation & Other Standards Yields Better Benefits* with (RII = 0.794). The 10th-ranking sub-variable, and the fifth sub-variable in the *Strategic Objectives* category, is *Accessibility & Convenience of an NBH for Later Life* with (RII = 0.790). The 11th-ranking

sub-variable, and the second sub-variable in the *Responsibilities, Skills & Expertise* category, is *Application of NPPF for Local Plan Development* with (RII = 0.790). The 12th-ranking sub-variable, and the sixth sub-variable in the *Strategic Objectives* category, is *Policy Frameworks for Development of NBHs* with (RII = 0.778). The 13th-ranking sub-variable, and the first sub-variable in the *Political Influence*, is *Political Support to Boost Housing Quality in terms of Space Performance* with (RII = 0.770).

The 14th-ranking sub-variable, and the second sub-variable in the *Effective Collaboration & Stakeholder Adoption* category, is *Early Engagement of Stakeholders for Planning Application System Enhancement* with (RII = 0.766). The 15th-ranking sub-variable, and the first sub-variable in the *Market Influence* category, is *Development of Housing Typologies Enhances Varied Customer Alternatives* with (RII = 0.766). The 16th-ranking sub-variable is *Permission to LPA to Adopt the NDSS & Other Space Standards* with (RII = 0.746). The 17th-ranking sub-variable, and the seventh sub-variable in the *Strategic Objective* category, is *Regulations Defining Spatial & Activity-based Needs of NBHs* with (RII = 0.742). The 18th-ranking sub-variable, and the third sub-variable in the *Effective Collaboration & Stakeholder Adoption* category, is *Local Community Consultation for the Development of Local Plan & Space Standards* with (RII = 0.734). The 19th-ranking sub-variable, and the second sub-variable in the *Market Influence* category, is *Stakeholder Consensus on Planning Enforcement & Space Standards Adoption* with (RII = 0.734). The 20th-ranking sub-variable, and the second sub-variable in the *Compliance Process & Technology Integration* category, is *Series of Compliance Visits to Ensure Space Standards Adherence* with (RII = 0.730). The 21st-ranking sub-variable, and the eighth sub-variable in the *Strategic Objectives* category, is *Focus on Identification of Generally Accepted Requirements to Improve Existing Space Standards* with (RII = 0.726). The 22nd-ranking sub-variable, and the third sub-variable in the *Political Influence* category, is *Role of Government Incentives on Adoption Rate of Space Standards* with (RII = 0.726). The 23rd-ranking sub-variable, and the third sub-variable in the *Market Influence* category, is *Development of High-Quality Space Compliant NBHs Enhances Market* with (RII = 0.706). The 24th-ranking sub-variable, and the third in the *Compliance Outcomes* category, is *Countrywide Adoption of Uniform Space Standards Enhances Equal Opportunities* with (RII = 0.694). The 25th-ranking sub-variable, and the ninth sub-variable in the *Strategic Objectives* category, is *Provision of Housing Option Advice to prospective NBH buyers* with (RII = 0.690). The 26th-ranking sub-variable, and the fourth sub-variable in the *Market*

Influence category, is *Reproducibility of Housing Typologies Enhances Space Standard Adoption* with (RII = 0.669).

Tab.5.13: Relative Importance Indices and Rankings of Compliance Factor Sub-variables

Compliance Factor Sub-variables	RII	Compliance Factor Codes	Rank
Development of Guidance & Best Practice examples on Housing Design, Site Layout, etc.	0.827	SO	1
Creation of Enabling & Sustainable Local Communities	0.819	SO	2
Strategic Planning of NBHs by Demography, Housing Typologies, Specification, etc.	0.802	SO	3
Identification of Space Required by Rooms/Houses to Meet Functional Needs	0.802	SO	4
Regulation of NBHs by LPA	0.802	RS	5
A Platform of Openness, Transparency, & Fairness for Space Standards Adoption	0.802	EC	6
Effective Site Planning & Construction Techniques for Design Quality Enhancement	0.802	CP	7
Space Standards Adoption Improves Residents' Quality of Life (Space, Accessibility, etc.)	0.794	CO	8
Space Standards' Joint Adoption with Building Regulation & Other Standards Yields Better Benefits	0.794	CO	9
Accessibility & Convenience of an NBH for Later Life	0.790	SO	10
Application of NPPF for Local Plan Development	0.790	RS	11
Policy Frameworks for Development of NBHs	0.778	SO	12
Political Support to Boost Housing Quality in terms of Space Performance	0.770	PI	13
Early Engagement of Stakeholders for Planning Application System Enhancement	0.766	EC	14
Development of Housing Typologies Enhances Varied Customer Alternatives	0.766	MI	15
Permission to LPA to Adopt the NDSS & Other Space Standards	0.746	PI	16
Regulations Defining Spatial & Activity-based Needs of NBHs	0.742	SO	17
Local Community Consultation for the Development of Local Plan & Space Standards	0.734	EC	18
Stakeholder Consensus on Planning Enforcement & Space Standards Adoption	0.734	MI	19
Series of Compliance Visits to Ensure Space Standards Adherence	0.730	CP	20
Focus on Identification of Generally Accepted Requirements to Improve Existing Space Standards	0.726	SO	21
Role of Government Incentives on Adoption Rate of Space Standards	0.726	PI	22
Development of High-Quality Space Compliant NBHs Enhances Market	0.706	MI	23
Countrywide Adoption of Uniform Space Standards Enhances Equal Opportunities	0.694	CO	24
Provision of Housing Option Advice to prospective NBH buyers	0.690	SO	25
Reproducibility of Housing Typologies Enhances Space Standard Adoption	0.669	MI	26

Establishment of a Feedback Mechanism to Enhance Compliance Reporting Process	0.665	EC	27
Application of New Technologies to Enhance Adoption of Space Standards for NBHs	0.665	CP	28
Space Standards Support by Procurement & Management Plans	0.661	CO	29
Government Hesitancy of Direct Enforcement of Space Standards	0.661	PI	30
Review of Housing Conditions of a proposed NBH	0.657	RS	31
Housebuilder Decisions on Design Criteria, Usability Factors, etc.	0.657	RS	32
Development of Value-driven Methodology for Evaluation of Housing Quality	0.657	CO	33
Private Sector Interference of Regulatory Decision	0.653	MI	34
Public Influence on Housing Developers to Adopt Space Standards	0.641	MI	35
Development of Spatially Compliant NBHs Increases Profit for Housing Developers	0.633	MI	36
Setting up of Compliance Committee	0.605	RS	37
Heavy Government Restriction on Land Supply for Sufficient NHB Development	0.577	PI	38
Marketing of New House Sizes by Bedroom Number	0.569	MI	39

The 27th-ranking sub-variable, and the fourth sub-variable in the *Effective Collaboration & Stakeholder Adoption* category, is *Establishment of a Feedback Mechanism to Enhance Compliance Reporting Process* with (RII = 0.665). The 28th-ranking sub-variable, and the third sub-variable in the *Compliance Process & Technology Integration* category, is *Application of New Technologies to Enhance Adoption of Space Standards for NBHs* with (RII = 0.665). The 29th-ranking sub-variable, and the fourth sub-variable in the *Compliance Outcomes* category, is *Space Standards Support by Procurement & Management Plans* with (RII = 0.661). The 30th-ranking sub-variable, and the fourth sub-variable in the *Political Influence* category, is *Government Hesitancy of Direct Enforcement of Space Standards* with (RII = 0.661). The 31st-ranking sub-variable, and the third sub-variable in the *Responsibilities, Skill & Expertise* category, is *Review of Housing Conditions of a proposed NBH* with (RII = 0.657). The 32nd-ranking sub-variable, and the fourth sub-variable in the *Responsibilities, Skills & Expertise* category, is *Housebuilder Decisions on Design Criteria, Usability Factors, etc.*, with (RII = 0.657). The 33rd-ranking sub-variable, and the fifth sub-variable in the *Compliance Outcomes* category, is *Development of Value-driven Methodology for Evaluation of Housing Quality* with (RII = 0.657). The 34th-ranking sub-variable, and the fifth sub-variable in the *Market Influence* category, is *Private Sector Interference of Regulatory Decision* with (RII = 0.653). The 35th-ranking sub-variable, and the sixth sub-variable in the *Market Influence* category, is *Public Influence on Housing Developers to Adopt Space Standards* with (RII = 0.641). The 36th-ranking sub-variable, and the seventh sub-variable in the *Market Influence* category, is

Development of Spatially Compliant NBHs Increases Profit for Housing Developers with (RII = 0.633). The 37th-ranking sub-variable, and the fifth sub-variable in the *Responsibilities, Skills & Expertise* category, is *Setting up of Compliance Committee* with (RII = 0.605). The 38th-ranking sub-variable, and the fifth sub-variable in the *Political Influence* category, is *Heavy Government Restriction on Land Supply for Sufficient NHB Development* with (RII = 0.577). The 39th-ranking sub-variable, and the eighth sub-variable in the *Market Influence* category, is *Marketing of New House Sizes by Bedroom Number* with (RII = 0.569). This is the lowest-ranking sub-variable of the entire research study.

5.4.4. Stage 4 – Testing of the Research Hypotheses

Blaikie (2003) enumerated the steps involved in the process of statistical hypothesis testing:

1. Stating the Null and Alternative Hypotheses. These have already been stated earlier (*Refer to Section 5.1.2 for a detailed list of the research hypotheses*).
2. Selection of the level of significance, also known as the α-value, to be normally at α = 0.05 (but possibilities of 0.01 or 0.001 not ruled out), with cognisance of type 1 and type 2 errors.
3. Identification of the most suitable statistical test based on the type of analysis and level of item measurement.
4. Computation of the value of the F-test using SPSS statistical package.
5. Decision on the acceptance or rejection of the null hypothesis, and the corresponding action on the alternative hypotheses.

The F-test statistic, named after Sir Ronald A. Fischer (who invented the statistical idea as the *ratio of variance* in the 1920s) was chosen for this stage of the study. The F-test is used for several purposes such as testing for the equality of variance, testing for the equality of several means, and testing for the significance of regression (Harkiolakis, 2017). However, testing for the equality of variance appears to apply closely to this section of this study, because of the presence of independent variables (compliance factors) *seeking to* predict the influence of one independent variable at a time on the dependent or criterion variable – spatial quality of New Build Homes. Hence, the One-way ANOVA will be used to test the hypotheses for the study

Blaikie (2003) highlighted the decision process of accepting or rejecting a null hypothesis. Blaikie stated that *Type 1 error* is the false rejection of a true null hypothesis, in favour of the alternative hypothesis; while *Type 2 error* is the false acceptance of a false null hypothesis, in favour of the alternative hypothesis. Blaikie confirmed that Type 1 error is a graver error to commit in any research study because a null hypothesis has been wrongly rejected, claiming that it is not true when it is actually true. The table below depicts the decision-making process involved in accepting or rejecting a null hypothesis, and the inherent errors to be avoided at all cost.

Table 5.14: Decision Table Indicating Type 1 &2 Errors

Null Hypothesis (H_0)	Decision	
	Accept H_0 (Reject $H_{1,2...}$)	**Reject H_0 (Accept $H_{1,2...}$)**
H_0 is True	OK	False rejection; α = probability of Type 1 Error
H_0 is False	False acceptance; β = probability of Type 2 Error	OK

Adapted from Blaikie (2003)

The *Significance Level*, also known as *alpha level*, is defined as the probability or likelihood of rejecting the null hypothesis when it is true. Before running the SPSS analysis package, the significance level was set at a scientifically and universally agreed value of $\alpha = 0.05$. Once the significance level has been set, the SPSS software computes a statistic known as the P-value. (Blaikie, 2003; Harkiolakis, 2017).

The *P-value,* also known as *confidence level***,** is the probability of an observed (or extreme) result happening by chance. In other words, the P-value is the probability that the observed statistic happened solely by chance, with the assumption that the null hypothesis was true. The P-value is also a way of stating the extremity of a statistic within a sample distribution (Blaikie, 2003; Harkiolakis, 2017).

The Significance Level (alpha value) is closely related with the Confidence Level (P-value) of any hypothesis test. The following are instances of the relationship (Blaikie, 2003; Harkiolakis, 2017):

- For statistical results with an 80% confidence level, the alpha value is 1 – 0.80 = 0.20;
- For statistical results with an 85% confidence level, the alpha value is 1 – 0.85 = 0.15;
- For statistical results with a 90% confidence level, the alpha value is 1 – 0.90 = 0.10;
- For statistical results with a 95% confidence level, the alpha value is 1 – 0.95 = 0.05, etc.

The *alpha value* establishes the benchmark of how data should be treated before the null hypothesis is rejected, while the *P-value* points out how extreme or dispersed the data collected is. The *P-value* is set side by side with the *alpha value* to decide whether the data being

analysed is significantly different from the null hypothesis. Hence, the two possibilities that aid the decision of testing hypotheses are summarised below (Blaikie, 2003; Harkiolakis, 2017):

1. When the *P-value* is greater than the *alpha value*, that is ($p > 0.05$), then the null hypothesis is accepted, and the alternative is rejected, thus making the result statistically insignificant;
2. When the *P-value* is less than or equal to the *alpha value*, that is ($p \leq 0.05$), then the null hypothesis is rejected in favour of the alternative hypothesis, thus making the result statistically significant

Following from Step 3 above, which is identification of the F-test technique most suitable for this section of the study – the One-way ANOVA technique has been considered most appropriate for this step. This is because the technique is applicable when the significance of the differences between any two means are to be tested, which could be between the means of only one dependent, criterion or outcome variable for a set of independent or predictor variables (Blaikie, 2003; Harkiolakis, 2017).

As earlier stated, the research concept is formulated in the form of a research question: *"What is the impact of 'Compliance Factors' on 'Spatial Quality' of New Build Homes in England?* Here, the *Compliance Factors* are the independent variables, while *Spatial Quality* is the only one dependent variable in this study. *Spatial Quality* could be measured by the *High-Quality of Spatially Compliant New Build Homes (NBHs)* deliverable to the end-users. Although, in the survey experiment, all the 39 variables were classed as independent variables, the only one variable that could serve as the closest estimation or measure of *Spatial Quality*, and as a dependent, *Criterion Variable* is the 35th variable, which is stated as: *Space Standards Adoption Improves Residents' Quality of Life (in terms of Space Performance, Accessibility, Flexibility, and Adaptability* (See Table 5.1).

For this purpose, the criterion variable is the only one dependent variable used for groups of independent or predictor variables in the instrument. However, there was no need to carry out a One-way ANOVA test for each of the 38 predictor variables against the criterion variable. Just a representative sub-variable in all the categorised variables of Strategic Objectives,

Responsibilities, Skills & Expertise, etc., would suffice. The criteria for choosing each representative sub-variable in every group of variables was by the highest of RII in each group because they are the ones with the best chance of evaluating the influence of a predictor variable on a criterion variable, so chosen (Johnson and LeBreton (2004). Therefore, the table below shows the predictor variables with the highest RII in their respective groups.

Table 5.15: Predictor Variables with the Highest RIIs

Categorised Variable	Predictor Variable	RII
Strategic Objectives	Development of Guidance & Best Practice examples on Housing Design, Site Layout, etc. ***(1st variable)***	0.827
Responsibilities, Skills & Expertise	Regulation of NBHs by LPA ***(5^{th} variable)***	0.802
Effective Collaboration & Stakeholder Adoption	A Platform of Openness, Transparency, & Fairness for Space Standards Adoption ***(6^{th} variable)***	0.802
Compliance Process & Technology Integration	Effective Site Planning & Construction Techniques for Design Quality Enhancement ***(7^{th} variable)***	0.802
Political Influence	Political Support to Boost Housing Quality in terms of Space Performance ***(13^{th} variable)***	0.770
Market Influence	Development of Housing Typologies Enhances Varied Customer Alternatives ***(15^{th} variable)***	0.766
Compliance Outcomes	Space Standards' Joint Adoption with Building Regulation & other Standards Yields Better Benefits ***(9^{th} variable)***	0.794

Following from Steps 4 and 5 above, which are: Computations of the values of the F-test using SPSS software, and Decisions made on the acceptance or rejection of the null hypothesis, with corresponding action on the alternative hypotheses – as the case may be. The following One-way ANOVA test tables are thereby derived:

Table 5.16: One-way ANOVA Test: Strategic Objectives Vs Criterion Variable

	Sum of Squares	Df	Mean Square	F	**P-value**
Between Groups	2.886	3	.962	1.099	.357
Within Groups	49.900	57	.875		
Total	52.787	60			

The P-value is 0.357, which is ($p > 0.05$), then the null hypothesis is accepted, and the alternative is rejected, thus making the result statistically insignificant at 35.7%, with a confidence interval of (100 – 35.7) % = 64.3%. Therefore, the hypothesis for this result holds that:

H_0: *There is no positive correlation between Strategic Objectives and Spatial Quality of NBH in England.*

Table 5.17: One-way ANOVA Test: Responsibilities… Vs Criterion Variable

	Sum of Squares	Df	Mean Square	F	**P-value**
Between Groups	9.543	3	3.181	4.178	.010
Within Groups	42.640	56	.761		
Total	52.183	59			

The P-value is 0.010, which is ($p \leq 0.05$), then the null hypothesis is rejected in favour of the alternative hypothesis, thus making the result statistically significant at 1%, with a confidence interval of (100 – 1) % = 99%. Therefore, the hypothesis for this result holds that:

H_2: *Responsibilities, Skills & Expertise factor has a positive influence on the Spatial Quality of NBH in England.*

Table 5.18: One-way ANOVA Test: Effective Collaboration… Vs Criterion Variable

	Sum of Squares	Df	Mean Square	F	**P-value**
Between Groups	14.933	3	4.978	7.495	.000
Within Groups	37.854	57	.664		
Total	52.787	60			

The P-value is 0.000, which is ($p \leq 0.05$), then the null hypothesis is rejected in favour of the alternative hypothesis, thus making the result statistically significant at 0%, with a confidence interval of (100 – 0) % = 100%. Therefore, the hypothesis for this result holds that:

H_3: *Effective Collaboration & Stakeholder Adoption factor has a positive influence on the Spatial Quality of NBH in England.*

Table 5.19: One-way ANOVA Test: Compliance Process…Vs Criterion Variable

	Sum of Squares	Df	Mean Square	F	**P-value**
Between Groups	12.631	3	4.210	5.961	.001
Within Groups	39.552	56	.706		
Total	52.183	59			

The P-value is 0.0010, which is ($p \leq 0.05$), then the null hypothesis is rejected in favour of the alternative hypothesis, thus making the result statistically significant at 0.1%, with a confidence interval of (100. – 0.1) % = 99.9%. Therefore, the hypothesis for this result holds that:

H_4: *Compliance Process & Technology Integration factor has a positive influence on the Spatial Quality of NBH in England.*

Table 5.20: One-way ANOVA Test: Political Influence Vs Criterion Variable

	Sum of Squares	Df	Mean Square	F	**P-value**
Between Groups	4.971	3	1.657	1.966	.130
Within Groups	47.212	56	.843		
Total	52.183	59			

The P-value is 0.130, which is ($p > 0.05$), then the null hypothesis is accepted, and the alternative is rejected, thus making the result statistically insignificant at 13.0%, with a confidence interval of (100 – 13.0) % = 87.0%. Therefore, the hypothesis for this result holds that:

H_0: *There is no positive correlation between Political Influence and Spatial Quality of NBH in England.*

Table 5.21: One-way ANOVA Test: Market Influence Vs Criterion Variable

	Sum of Squares	Df	Mean Square	F	**P-value**
Between Groups	8.154	3	2.718	3.471	.022
Within Groups	44.633	57	.783		
Total	52.787	60			

The P-value is 0.022, which is ($p \leq 0.05$), then the null hypothesis is rejected in favour of the alternative hypothesis, thus making the result statistically significant at 2.2%, with a confidence interval of (100 – 2.2) % = 97.8%. Therefore, the hypothesis for this result holds that:

H_6: *Market Influence factor has a positive influence on the Spatial Quality of NBH in England.*

Table 5.22: One-way ANOVA Test: Compliance Outcomes Vs Criterion Variable

	Sum of Squares	df	Mean Square	F	**P-value**
Between Groups	30.238	3	10.079	25.480	.000
Within Groups	22.548	57	.396		
Total	52.787	60			

The P-value is 0.000, which is ($p \leq 0.05$), then the null hypothesis is rejected in favour of the alternative hypothesis, thus making the result statistically significant at 0%, with a confidence interval of (100 – 0) % = 100%. Therefore, the hypothesis for this result holds that:

H7: *Compliance Outcomes factor has a positive influence on the Spatial Quality of NBH in England.*

5.5. INTEGRATION OF QUALITATIVE FINDINGS

The introduction of qualitative open-ended questions as part of the quantitative questionnaire survey instrument was not meant to take the place of the exploratory semi-structured interview studies conducted prior to the survey. Instead, the open-ended questions were included in the survey instrument to provide additional perspective and enhance the insights gained from the close-ended questions of the survey. However, an integration of the refined findings from the open-ended questions and the pre-survey interview studies will be necessary to enrich the qualitative data from the semi-structured interviews for triangulation purposes. The table below illustrates this concern. It is noted that the Braun and Clarke 6-step framework has been utilised to generate the table below. However, because the open-ended statements were generated within existing compliance code categories *(see column 1 of table below)* accompanied with their own embedded themes *(see column 3)*, it would not be necessary to apply Steps 1 – 3 of the Braun and Clarke 6-step framework, such as: Step 1 – Familiarising oneself with data; Step 2 – Generating initial codes; Step 3 – Searching for themes; and Step 4 – Reviewing themes.

Notwithstanding, Steps 5 – 6 of the framework will be applied to the analysis of the open-ended statements. Step 5, which is about defining and naming themes, will seek to refine the

specifics of each embedded themes of the open-ended statements in column 3, thus generating clear definitions and names for each theme in column 4 of the table below.

Tab.5.23: Thematic Integration of Open-ended Statements and Interview Transcripts

Compliance Codes	Interview Themes	Open-ended Statements	Open-ended Themes
Strategic Objectives	The space standards and technical housing documents set out the policy guidance for regulatory compliance of spatial requirements. Some of the documents mentioned across interview participants included: • Housing Act of 1985 (Part 10), • The Modern Housing Act of 2004, • Environmental Health Policy, • Parker Morris Standard, and • National Planning Practice Guidance	• The NDSS should be taken into the Building Regulations, and applied to all NBHs • All London Authorities require proposals to comply with the London plan • Any deviation from the approved drawings, under-sized units, or anything else, will result in planning enforcement procedures; • Proposed evaluation of performance data for new build housing, as it exists for new cars • Strategic planning of new homes using varied criteria, is a separate matter to space standards • Space identification required to allow rooms and houses to meet their functional purposes, is the main reason why space standards are adopted • Proposed combination of Cost/Value data into the assessment of space standards • Area defined policies for Local Plan, recognising area needs and differences; but compliant with a baseline New Build space standard	• NDSS to be made a Building Regulation for nationwide application • All London Authorities require proposals to comply with the London Plan • Any deviation from approved drawings result in planning enforcement procedures • Performance data for NBHs evaluation • Strategic planning, a separate matter from HSS • The general rationale behind HSS is functional needs • Cost/Value data for HSS Assessment • Local Plan policies to reflect local area needs and differences • Local Plan policies to be compliant with a national baseline of space standards

Responsibilities, Skills & Expertise	• The *Planning Team* gets a job or referral of plans and drawings, and then one of his team. • A *Case Officer* takes those drawings, examines them, measures the room, compares the layout, and makes a judgement about them. • The *Client* obtains a formal response from the team, which is then added to the planning process to make a decision whether to approve the building plan or not. • The *Planning Team* sends a response to the developer on its decision.	• The NPPF document is mandatory • Compliance factors not been applied across all sectors is an issue; it cannot be Housing Associations only, and not Housebuilding sectors, otherwise they will not be competitive on acquiring land. • The problem is always lack of capacity in the LPAs. • Like to see more monitoring and compliance checking of new build schemes by the LPA. Currently, the LPA has very limited ability (resources & powers) to check compliance of as-built housing.	• NPPF is mandated for local plan policy guidance by LPAs • Compliance is not the sole prerogative of the housing associations or developers alone • LPA's lack of adequate capacity • LPAs are responsible for monitoring and compliance checking of NBH schemes • LPAs have limited resources to check compliance of as-built housing
	• The *Developer* negotiates with the Planning Team to get the building to meet the standards.	• Developers are not really part of the enforcement team	• Developers are not actively involved in the enforcement of requirements
	• The *Building Control Officer*, conduct *compliance visits* to the site to check the building at different stages to ensure compliance at every stage till completion such that it could be checked if what was been built and completed meets the space standard set out at the beginning.	• NDSS in NBHs should be checked/assessed by Building Control department • The Building Control department is also responsible for the development of NBHs in the council	• NDSS in NBHs to be checked by Building Control • Building Control also responsible for NBHs
Effective Collaboration & Stakeholder Adoption	• Communication is primarily via policy documents such as Government Technical Requirements, Local Plan Policy, and Supplementary Planning Guidance.	• There was an early communication or collaboration on the NDSS before adoption • We are trying to adopt them but have found the process to be complex, lengthy, and costly in terms of gathering evidence on local needs and viability. And then trying to update Local Plan policy to make the NDSS a requirement for NBHs. We	• Early NDSS collaboration • Evidence-gathering on local needs and assessment, a lengthy and costly process • Evidence-gathering requires effective collaboration

	• Consultations are also carried out between the regulatory bodies and the local community.	are still trying to navigate through this process • It is imperative to consult with LPAs on any developments in order to adhere to their local policies, particularly around space standards • Developers are not really part of the stakeholders' consensus • The Planning Enforcement establishes the feedback mechanism to enhance compliance reporting	• Local Plan Policy updates on NDSS is onerous • Consultations with LPAs • Developers are not actively involved in stakeholder consensus • Feedback mechanism enhances compliance reporting
Compliance Process & Technology Integration	Existing technological tools used in the planning and housing sectors are: • Email, • Telephone, • Measuring Tape, • Digital Cameras, Printers, etc. to capture compliance violations • 2D CAD and file-based collaboration.	• A series of compliance visits should not be required to ensure adherence to required standards. These should have been designed, approved, and built in accordance with the plans submitted • Proposed utilisation of BIM in design and development of NBHs; looking into assistive/new technologies to aid residents living in new and existing properties • Building Control department should check for and certify compliance • Technologies such as CAD are currently being used • Naturally, undersized dwellings are not constructed according to approved drawings, which is a breach of planning permission, and may be prosecuted;	• Compliance Visits not necessary • NDSS requirements should be designed, approved and built into submitted plans • BIM Utilisation in design and development of NBHs • Assistive or new technologies to aid residents • Building Control to check and certify compliance • CAD still commonly used technology • Constructing undersized buildings is a deliberate act • Breach of planning permission

		• Compliance visits are conducted only when there is a breach of requirements.	• Compliance visits are necessary only when a breach occurs
Political Influence	• There is also a general opinion that the new space standard is aspirational, having little chance of influencing New Builds because there are no incentives for Developers to adopt the standard. • There is currently no uniformity of Space Standards in the industry, despite government's efforts. A lack of uniformity causes the less economically viable cities to be places of less choice and investment.	• Not convinced there is the political will to enforce that private developers build bigger homes • A key issue is that the NDSS are only optional rather than mandatory. • The space standards requirements seem aspirational • Some LPAs may try to set standards which are not viable to build in an open market; this could distort the market cross different authorities • Any LPA with a sound local plan will require Developers to adhere to national space standards • LPA adoption could be done through local plans • Key issue, for instance, is that some developers build 2 bed 3 person houses with a GIA of 59m^2 compared to the NDSS requirement of 70m^2.	• Lack of political will to enforce NDSS • NDSS requirements are still optional • The NDSS spatial requirements seem aspirational • Local standards may not be viable for the open market • Local standards may distort market across local authorities • LPAs to develop sound local plan for NDSS adoption • LPAs to wield influence over Developers to comply • Developers build below the NDSS requirement
Market Influence	• The big problem is getting developers to comply with the standard, because they reduce the internal spaces of buildings to increase the building density on a specific location, so as to maximise profit.	• Developers are driven by profit and share price, so they tend to build to minimum requirements • Need to consider modern methods of construction more, which will allow more reproducibility of homes and ensure space standards are met whilst development costs are controlled • The marketing of new house sizes by the number	• Developers are driven by profit and share price, so they tend to build to minimum requirements • Need for modern methods of construction • Modern methods lead to reproducibility of NBHs • Modern methods enhance space standards compliance • Modern methods keep development costs controllable • Selling NBHs by number of

		of bedrooms, is very bad in luxury market; • NDSS are mandatory in London, except for a niche luxury market • Some housebuilders build above the space standards to meet their niche markets • Due to the luxury market, we face difficulties with over-sized dwellings and amalgamation where space standards can only be used as a benchmark; • In our council, we have hardly any new buildings, and issues with Developers vastly exceeding NDSS to provide to the luxury overseas market, hence, we have very few enforcement cases involving under-sized new build properties, mainly an issue with conversions. • Whilst, space standards are clearly important for the Housing Association sector, as rents are regulated, increased space requirements result in increased costs, potentially suppressing supply.	bedrooms is bad for the luxury market • NDSS mandatory in London • Niche luxury market build beyond NDSS in London • Oversized dwellings make space standards difficult to set as a benchmark • Luxury overseas market creates demand for oversized dwellings • Housing Associations value the impact of space standards • Increased spatial requirements lead to increased costs • Increased spatial requirements lead to increased demand, and decreased supply
Compliance Outcomes	• There is a common misconception that the introduction of new technology is all about managing the process of constructing a building than using it for compliance and seeking for planning permission; and that there is no direct interface as yet between any new technology and the checking and planning application, as such, with respect to the NDSS.	• Development costs differ greatly across the UK so common space standards may be difficult to enforce • Light, Ventilation, Aspect, and Accessibility are also considerations • When Developers are granted Planning Permission to build affordable homes substantially below the NDSS guidance; this could lead to unsustainable tenancies	• Development costs vary across the UK • Difficulty to enforce a common HSS as a result • Compliance is a wholistic approach involving other housing requirements • Non-compliance with NDSS leads to unsustainable tenancies

	• The approach to space standards for new build housing varies for a local authority such as ours because of the different delivery mechanisms and routes, such as public/private partnership housing delivery vehicles, etc. Some of the new homes we acquire or directly deliver will meet the standards, but others will not.	• Approach to HSS adoption varies across local authorities • Different delivery mechanisms or procurement routes affect HSS adoption
	• Compliance factors not been applied across all sectors is an issue; it cannot be Housing Associations only, and not Housebuilding sectors, otherwise they will not be competitive on acquiring land	• Non-compliance by Housing Associations or Developers makes them less competitive on land acquisition

5.5.1. Thematic Report of Integrated Qualitative Findings

This is the 6th step of the Braun and Clarke thematic analysis framework, which involves an analysis of vivid and compelling data extracts from the prior interview transcripts and the open-ended questions. The integrated qualitative findings will be presented relating back to the research question.

According to the *Strategic Objectives* compliance factor, the integrated qualitative findings are as follows. The Housing Space Standards (HSS) and Policy Frameworks set out the policy guidance for regulatory compliance of spatial requirements. The general rationale behind these HSS is to cater to functional needs of the residents. Some of these technical documents include Housing Act of 1985 (specifically Part 10), the Modern Housing Act of 2004, the Parker Morris Standard, the National Planning Practice Guidance, etc, such that any deviation from approved drawings will result in planning enforcement procedures. However, the most recent of these housing space standards happens to be the NDSS, which is being deliberated by the Government to be made a Building Regulation for nationwide application of spatial requirements to NBHs in England. In London metropolis, for instance, all the local authorities

still require proposals to comply with the London Plan. The local plan policies are established to reflect local needs specific to the local community, and differences from other localities. The local plan policies are intended to be designed in such a way as to be compliant with a national baseline of space standards. In an effort to enhance compliance checking of plan drawings, performance data for NBH evaluation and cost-value data for HSS assessment have been proposed.

According to the *Responsibilities, Skills & Expertise* compliance factor, the integrated qualitative findings are as follows. There is a shared responsibility amongst the following planning and housing stakeholders. The NPPF is mandated for local plan policy guidance by LPAs or the Planning Team. The LPAs are responsible for monitoring and compliance checking of new build housing schemes. Even though, the LPAs lack adequate capacity, and have limited resources to check compliance of as-built housing. The Planning Team gets a job or referral of plans and drawings, and then one of his team. A Case Officer takes those drawings, examines them, measures the room, compares the layout, and makes a judgement about them. The Client obtains a formal response from the team, which is then added to the planning process to decide whether to approve the building plan or not. The Planning Team then sends a response to the Developer on its decision. Compliance is not the sole prerogative of the Housing Associations or Developers alone, hence the Developer negotiates with the Planning Team to get the building to meet the standards; though Developers are not actively involved in the enforcement of requirements. The Building Control Officer conducts compliance visits to the site to check the building at different stages to ensure NDSS or other HSS compliance at every stage till completion such that it could be checked if what was been built and completed meets the space standards set out at the beginning; this way the Building Control department is also responsible for the development of NBHs in the community.

According to the *Effective Collaboration & Stakeholder Adoption* compliance factor, the integrated qualitative findings are as follows. Communication and collaboration are primarily via policy documents such as Government Technical Requirements, Local Plan Policy, and Supplementary Planning Guidance. Consultations are carried out between the regulatory bodies (i.e. LPAs) and their local communities on any developments in order to adhere to their local policies, specifically around space standards. There is usually an early collaboration on

the NDSS requirements before adoption in a local community. This involves an evidence-gathering on local needs and viability assessments, which is usually a lengthy and costly process, hence requiring effective collaboration. Also, trying to update the Local Plan Policy to make the NDSS a standard requirement for NBHs in an area is an onerous task. The Planning Enforcement teams in the LPAs establish the feedback mechanism to enhance compliance reporting. However, it was found out that House Developers are not actively involved in stakeholder consensus regarding regulatory compliance with housing standards.

According to the *Compliance Process & Technology* Integration compliance factor, the integrated qualitative findings are as follows. A number of existing technological tools used in the planning and housebuilding sectors include email, telephone, measuring tape, digital cameras, printers, etc., to capture compliance violations, and 2D CAD for file-based collaboration. In fact, CAD is still a commonly used technology. The utilisation of BIM in design and development of NBHs was proposed. Also, assistive or new technologies to aid residents living in new and existing properties were proposed. As part of the compliance process, the Building Control department checks for and certifies compliance with spatial requirements. It was found that a series of compliance visits are not necessary to ensure adherence to required standards. However, compliance visits are only necessary when a breach of planning permission occurs, which is a deliberate act of constructing undersized buildings as opposed to the approved drawings. A strict adherence to the NDSS requirements was suggested to be designed, approved and built into submitted plan drawings.

According to the *Political Influence* compliance factor, the integrated qualitative findings are as follows. It was found that there is a general opinion that the relative new space standard (NDSS) is aspirational. The key issue is that the NDSS are only optional rather than mandatory. There is currently no uniformity of space standards in the industry, despite Government's efforts. A lack of uniformity causes the less economically viable cities to be places of less choice and investment. A lack of political will to enforce that private developers build bigger homes exists, thus having a little chance of influencing new builds because there are no incentives for Developers to adopt the space standard. Some LPAs have tried to set their own standards that are not viable to build in an open housing market, which have further distorted the market across local authorities in the country. As a result of this, it was suggested that LPAs

are to develop sound local plan for NDSS adoption, while wielding influence over Developers to comply. Since many Developers build below the NDSS requirement, such that 2 bed 3 person houses with a GIA of 59m^2 are built compared to the NDSS requirement of 70m^2.

According to the *Market Influence* compliance factor, the integrated qualitative findings are as follows. The big problem was found to be getting developers to comply with the standard, since they reduce the internal spaces of buildings to increase the building density on a specific location for profit maximisation purposes. Developers are driven by profit and share price, so they tend to build to minimum requirements. It was suggested that developers need to consider modern methods of construction, since these modern methods lead to reproducibility of NBHs, thereby enhancing compliance with space standards, whilst developmental costs are more easily controlled. The marketing of new house sizes by the number of bedrooms is considered abysmal for the luxury market. Developers will rather sell NBHs by bedroom floor sizes, which makes the NDSS mandatory and acceptable in London, except for the niche luxury market where some housebuilders build above the NDSS to meet the ever-growing demand by overseas market for oversized luxury dwellings. This creates a huge problem such that oversized dwellings make space standards difficult to set as a benchmark for compliance. Furthermore, as clients on the buying side of the housing value chain, the Housing Associations value the impact of space standards. As rents and the buying markets are regulated, increased spatial requirements will lead to increased costs, meaning increased profits. Increased spatial requirements will also lead to increased demand, and decreased supply, thus driving up profits.

According to the *Compliance Outcomes* compliance factor, the integrated qualitative findings are as follows. It was noted that there is a common misconception that the introduction of new technology is all about managing the process of constructing a building than using it for compliance and seeking for planning permission; and that there is no direct interface as yet between an emerging technology, a compliance checking process, and the planning application, as such, with respect to the NDSS. Apart from *Space*, compliance is a wholistic approach involving other housing standards or requirements such as *Light*, *Ventilation*, *Aspect*, *Accessibility*, etc. One of the sub-factors militating against compliance is that development costs vary across the UK, hence the difficulty to enforce a common space standard. It was also found that when developers are granted planning permission to build affordable homes, some

of them build substantially below the NDSS guidance, thus leading to unsustainable tenancies or tenures. Across local authorities, it was found that the approach to HSS adoption for new build housing varies for several reasons. For instance, different delivery mechanisms or procurement routes employed by the developer such as public-private partnership, affect HSS adoption in that some of the NBHs acquired or directly delivered by the developer may or not meet the standards required. The problem of non-compliance is an issue concerning all stakeholders in the industry – not only a concern for the Housing Associations or Developers. However, non-compliance by Housing Associations and Developers will make them less competitive on land acquisition.

5.6. SUMMARY

This chapter presented the research concept, a list of research hypotheses, research methodology, empirical data analysis and interpretations. The survey goal was deemed to have been achieved as the key compliance factors influencing the adoption of space standards for New Build Homes in England were investigated and analysed. The top three compliance factors that stood out from the rest were: *Strategic Objectives*, *Responsibilities, Skills & Expertise*, and *Effective Collaboration & Stakeholder Adoption*. The chapter went a step further to verify the research hypotheses from an empirical point of view with the use of the One-way ANOVA analysis. The findings indicated that of all the compliance factors tested, *Strategic Objectives* and *Political Influence* were found to have no positive correlation with *Spatial Quality of NBH*. This is quite contradictory because the *Strategic Objectives* factor, found to be the most key compliance factor, ironically had no positive relationship with *Spatial Quality of NHB* in England. How could this be? The next chapter will expatiate further and attempt to present the reasons why. Hence, Objectives 3 and 4 of the research study were fully deemed to have been achieved.

CHAPTER 6

DISCUSSION OF FINDINGS

6.1. INTRODUCTION

In this chapter, research implications of the results of relative importance indices and hypotheses testing from the preceding chapter will be discussed in detail. Even though, the *Strategic Objectives* factor has up to 9 sub-variables, and the *Compliance Process & Technology Integration* factor has only 3 sub-variables in its category, nonetheless the discussion of findings will cover all sub-variables (including the correlation between the least sub-variables and the regulatory compliance problem) across all the categories for the sake of enrichment and completion, and their implications highlighted. Hence, the completion of this chapter fulfils the achievement of the final Objective 5 of the research study.

6.2. DISCUSSION OF RESEARCH FINDINGS

6.2.1. The Influence of Strategic Objectives on Spatial Quality of NBHs

The conducted research established that *Strategic Objectives* was the top-ranking compliance factor with the highest and an aggregated relative importance index (RII = 0.775).

The 1st-ranking sub-variable is *Development of Guidance & Best Practice examples on Housing Design, Site Layout, etc.* with (RII = 0.827). The result indicates that the topmost strategic objective of most Housing Space Standards and Policy Frameworks, before actual compliance, is the provision of guidance and best practice examples on housing design, site layout, etc. This result reflects the fundamental assertion of Fu et al (2007) that Space is one of the most important elements of building design to define the users' requirements and functions of a building. This is also in line with the integrated qualitative findings (i.e. the semi-structured interviews and the open-ended statements in the questionnaire survey) that the HSS and Policy Frameworks set out the policy guidance for regulatory compliance of spatial requirements. Hence, the LPAs have a fundamental duty of developing guidance notes, policy frameworks for regulating internal space of buildings in their localities.

The *Creation of Enabling & Sustainable Local Communities*, a *Strategic Objective* sub-variable, is the 2nd-ranking sub-variable with (RII = 0.819). It is understandable why this sub-variable is ranked second in the *Strategic Objectives* category; this finding is consistent with the 2016 Housing Standards Review, which was designed to streamline and simplify the planning process for creating quality, sustainable housing in the UK (LocalGov, 2016). This result supports the integrated qualitative findings such that in London metropolis, for instance, all the local authorities still require proposals to comply with the London Plan. The local plan policies are established to reflect local needs specific to the local community. The local plan policies are also intended to be designed in such a way as to be compliant with a national baseline of space standards.

Another *Strategic Objective* sub-variable, *Strategic Planning of NBHs by Demography, Housing Typologies, Specification, etc.,* is the 3rd-ranking sub-variable with (RII = 0.802). This result accords well with the earlier statement of DCLG (2015b) that strategic planning of NBHs involves the setting out of requirements for the Gross Internal Areas of new dwellings at a defined level of occupancy as well as floor areas and dimensions for key parts of the home, especially spaces like bedrooms, storages, and floor to ceiling height. This result is also supported by Vale (2002), who spotted a loophole exploited by House Developers, where a 2b3p NBH is marketed as a 2b4p one. Vale further suggested that this ambiguity is manageable only if LPAs would exercise a control mechanism of establishing clear regulatory requirements for *unit mix*, which is defined as the number of apartments of different sizes and their distribution (*See Tab.3.3 for an illustration of what unit mix means*). This loophole exploited by House Developers is most probably the main reason why the one-way ANOVA test showed that the result was statistically insignificant at 35.7%, thereby nullifying any positive correlation between *Strategic Objectives* and *Spatial Quality of NBHs in England.*

It is evident from the table that the first four sub-variables belong to the *Strategic Objectives* category; hence, the 4th-ranking sub-variable is *Identification of Space Required by Rooms/Houses to Meet Functional Needs* with (RII = 0.802). This seems to be a primary essence of compliance with spatial requirements. The result confirms the earlier statement of Fu et al (2007) that Space is one of the most important elements of building design to define the users' requirements and functions of a building. This result is also in agreement with the integrated qualitative findings stating that the general rationale behind these HSS is to cater to

functional needs of the residents. Hence, the LPAs have a strategic role of identifying what space is required to successfully meet the functional needs of end-users.

The 10th-ranking sub-variable, and the fifth sub-variable in the *Strategic Objectives* category, is *Accessibility & Convenience of an NBH for Later Life* with (RII = 0.790). This result agrees with the findings of Ministry of Housing and Local Government (1961); CABE (2009); and London Housing Strategy (2010), that one of the benefits of flexibility of homes with sufficient space is the fact it is easier to adapt to changing needs, preferences and lifestyles of dwellers. Hence, dwellers acquire such properties with accessibility and convenience at the back of their minds.

The 12th-ranking sub-variable, and the sixth sub-variable in the *Strategic Objectives* category, is *Policy Frameworks for Development of NBHs* with (RII = 0.778). This result is attributable to the Government's Housing Standards Update (published in March 2015), which led to the significant reorganisation of codes, standards, rules, regulations and guidance applied by local authorities for new house developments (DCLG, 2017).

The 17th-ranking sub-variable, and the seventh sub-variable in the *Strategic Objective* category, is *Regulations Defining Spatial & Activity-based Needs of NBHs* with (RII = 0.742). This outcome confirms that the starting point is the need for rooms to be able to accommodate a basic set of furniture, fittings, activity, and circulation space appropriate to the function in terms of meeting typical day to day needs at a defined level of occupancy as well as floor areas and dimensions for key parts of the home, notably bedrooms, storage and floor to ceiling height (DCLG, 2014; DCLG, 2015b).

The 21st-ranking sub-variable, and the eighth sub-variable in the *Strategic Objectives* category, is *Focus on Identification of Generally Accepted Requirements to Improve Existing Space Standards* with (RII = 0.726). This result confirms that the new planning standard, NDSS, was developed to rationalise existing space standards into a single national approach (DCLG, 2014). This result also confirms the integrated qualitative findings that some of the existing space standards and policy frameworks include the Housing Act of 1985, the Modern Housing Act of 2004, the Parker Morris Standard, the NPPG, etc., such that any deviation from approved drawings will result in planning enforcement procedures. However, the most recent of these

space standards is the NDSS, which is being deliberated by the Government to be made a Building Regulation for nationwide application of spatial requirements to NBHs in England.

The 25th-ranking sub-variable, and the ninth sub-variable in the *Strategic Objectives* category, is *Provision of Housing Option Advice to prospective NBH buyers* with (RII = 0.690). This result is corroborated by the literature findings that the UK Government introduced several regulations and incentives including subsidy and council house building programme to deliver a good standard product for working households (DLA, 2015).

6.2.2 The Influence of Responsibilities…on Spatial Quality of NBHs

The results of this study show that *Responsibilities, Skills & Expertise* was the second-ranking compliance factor with an aggregated relative importance index (RII = 0.765).

The 5th-ranking sub-variable, and the first sub-variable in the *Responsibility, Skills & Expertise* category, is *Regulation of NBHs by LPA*, with (RII = 0.802). It is understandable why this is a top-ranking sub-variable. Consistent with the literature, DCLG (2015a) stated that the establishment of compliance and enforcement actions primarily rests with the Planning departments of local authorities; stressing the fact that the Building Control departments will have minimal involvements in the checking or enforcement of the space standards, except in rare cases of spatial requirements checking of development proposals, as an additional service alongside their primary building control function. In such rare cases, the Planning department may avoid further additional checking of plans with regards to space standards requirements. This result also agrees with the integrated qualitative findings that the LPAs are responsible for monitoring and compliance checking of new build housing schemes.

The 11th-ranking sub-variable, and the second sub-variable in the *Responsibilities, Skills & Expertise* category, is *Application of NPPF for Local Plan Development* with (RII = 0.790). This study supports evidence from DCLG (2015a), stating that the coordination of compliance and enforcement activities is informed by the application of NPPF to demonstrate local need of the community as part of the Local Plan development. This result also concurs with the integrated qualitative findings that the LPAs adopt the NPPF for local plan policy guidance in the local communities.

The 31st-ranking sub-variable, and the third sub-variable in the *Responsibilities, Skill & Expertise* category, is *Review of Housing Conditions of a proposed NBH* with (RII = 0.657). This is a low-ranking sub-variable probably because this activity is less frequently done by the local planning officials. Comparison of this result with literature findings of DLA (2015) confirms that a stakeholder review and consolidation process is necessary to examine the rationale behind space standards, housing conditions, and provide evidence of the benefits of floor space standards for NBHs.

The 32nd-ranking sub-variable, and the fourth sub-variable in the *Responsibilities, Skills & Expertise* category, is *Housebuilder Decisions on Design Criteria, Usability Factors, etc.,* with (RII = 0.657). This result further reinforces the idea of RIBA (2011), that adherence to Space Standards and exploration of available Space enhances the possibilities of greater design and layout arrangement of NBHs. This result mirrors the findings of Drury (2008) that public concern for functionality and usability factors nearly always redefines societal thinking on the review of internal space standards since the introduction of Parker Morris' standard (GPF4). (*See Tab.3.11).* The result also supports a similar concern of Carmona et al (2010) that space standards may be established below the cultural norm, as the quality of NBHs may be benchmarked against long-term usability and adaptability.

The 37th-ranking sub-variable, and the fifth sub-variable in the *Responsibilities, Skills & Expertise* category, is *Setting up of Compliance Committee* with (RII = 0.605). This research outcome is supported by the concession between the lines of reasoning of *consequences* and *appropriateness,* which is typical of many contributions to the knowledge of regulatory compliance (Mitchell, 2007). Setting up a compliance committee also helps to facilitate the convergence of diverse ideas to tackle the "plurality of motivations", of which the most prevalent response by compliance theorists has been to merge a handful of different models of action (Etienne, 2011).

6.2.3. The Influence of Effective Collaboration… on Spatial Quality of NBHs

The current study found that *Effective Collaboration & Stakeholder Adoption* was the third-ranking compliance factor with an aggregated relative importance index (RII = 0.742).

The 6th-ranking sub-variable, and the first sub-variable in the *Effective Collaboration & Stakeholder Adoption* category, is *A Platform of Openness, Transparency, & Fairness for Space Standards Adoption* with (RII = 0.802). This is the top-ranking sub-variable of the category. This may be explained by the fact that Park (2017) affirmed that a uniform space standard would enhance an open, level playing field for all stakeholders in achieving their duties. Additionally, this result is justified by the integrated qualitative findings in the sense that effective collaboration among stakeholders is facilitated by an open, transparent, and fair communication based on policy documents such as Government Technical Requirements, Local Plan Policy, and Supplementary Planning Guidance.

The 14th-ranking sub-variable, and the second sub-variable in the *Effective Collaboration & Stakeholder Adoption* category, is *Early Engagement of Stakeholders for Planning Application System Enhancement* with (RII = 0.766). A possible explanation for this result could be buttressed by the fact that Building Control officials may be invited by Planning officials in the early stages of some development proposals (DCLG, 2015a), suggesting that stakeholders could work together on how space standards could be complied with. This result indicates that this sub-variable is an effective collaborative and stakeholder adoption technique, after a platform of openness, transparency, and fairness for space standards have been established. The integrated qualitative findings corroborate this result in that there is usually an early collaboration on NDSS requirements before adoption in a local community. This involves an evidence-gathering on local needs and viability assessments, which is usually a lengthy and costly process, hence requiring effective collaboration.

The 18th-ranking sub-variable, and the third sub-variable in the *Effective Collaboration & Stakeholder Adoption* category, is *Local Community Consultation for the Development of Local Plan & Space Standards* with (RII = 0.734). A possible explanation for this result might be the mild resistance of established space standards into the existing political and developmental culture of local communities in England; or whether the adoption of these standards would only be possible after a cultural shift has occurred (Gallent, et al, 2010). The integrated qualitative findings support this result in that consultations are carried out between the regulatory bodies (LPAs) and their local communities on any developments in order to adhere to their local policies, specifically around space standards.

The 27th-ranking sub-variable, and the fourth sub-variable in the *Effective Collaboration & Stakeholder Adoption* category, is *Establishment of a Feedback Mechanism to Enhance Compliance Reporting Process* with (RII = 0.665). This result indicates that this sub-variable is an effective collaborative and stakeholder adoption technique, after a local community consultation for the Development of Local Plan & Space Standards has been held. This result is also supported by the integrated qualitative findings stating that the Planning Enforcement teams in the LPAs establish the feedback mechanism to enhance compliance reporting. The fact that this sub-variable is ranked quite low is evidence that the LPAs' feedback mechanisms are not very efficient towards enhancing compliance reporting.

6.2.4. The Influence of Compliance Process… on Spatial Quality of NBHs

Another important finding is that *Compliance Process & Technology Integration* was found to be the fourth-ranking compliance factor with an aggregated relative importance index (RII = 0.732).

The 7th-ranking sub-variable, and the first sub-variable in the *Compliance Process & Technology Integration* category, is *Effective Site Planning & Construction Techniques for Design Quality Enhancement* with (RII = 0.802). This result further supports the idea that adoption of space standards is not enough to achieve a standard design quality but could be complemented with effective site planning and precise construction techniques to achieve design quality of NBHs (GPF4) *(See Tab3.11).* This result is further enhanced by the integrated qualitative findings in that site planning and construction techniques still in use today in the planning and housebuilding sectors include email, telephone, measuring tape, digital cameras, printers, etc, to capture compliance violations, and 2D CAD for file-based collaboration.

The 20th-ranking sub-variable, and the second sub-variable in the *Compliance Process & Technology Integration* category, is *Series of Compliance Visits to Ensure Space Standards Adherence* with (RII = 0.730). This result is elaborated by the integrated qualitative findings such that the Building Control department invites the Planning department on site visits of decent-sized projects, conversion of a building to a large apartment building, conversion of a large HMO, and other big buildings, etc. There may be involvement at a few stages along the way due to revisions, but there is always a compliance visit at the end. Also, at the end of the

building regulation process, when all is done and built, the housing standards department is invited along to make sure that what has been built and completed meets the spatial requirements set out at the outset. However, it was found that a series of compliance visits are not necessary to ensure adherence to required standards. Compliance visits are only necessary when a breach of planning permission occurs, which is a deliberate act of constructing undersized buildings as opposed to the approved drawings. Therefore, a strict adherence to the NDSS requirements was suggested to be designed, approved and built into submitted plan drawings.

The 28th-ranking sub-variable, and the third sub-variable in the *Compliance Process & Technology Integration* category, is *Application of New Technologies to Enhance Adoption of Space Standards for NBHs* with (RII = 0.665). This finding is supported by the assertation of Fu et al (2007) that Space has become an even more important concept in computer-based information systems applied in the process of building design, construction, and management. A possible interpretation of this result may be the lack of application of new technologies that would enable LPAs to overcome such difficulties as ensuring effective compliance, making decisions on the level of checking to be performed, checking whether the building information supplied by developers are accurate, and minimising the administrative bottlenecks experienced by applicants when providing such information (HATC, 2006). Furthermore, it has been estimated that housebuilders spend a lot of time providing building information of NBHs, at the rate of 3 minutes per dwelling, with the use of CAD, to the planning authorities (HATC, 2006). According to the integrated qualitative finding, the CAD is still a commonly used technology, however, the utilisation of BIM in design and development of NBHs has been proposed to enhance adoption of space standards for NBHs in England.

6.2.5. The Influence of Political Influence on Spatial Quality of NBHs

In this study, *Political Influence* was found to be the sixth-ranking compliance factor with an aggregated relative importance index (RII = 0.696).

The 13th-ranking sub-variable, and the first sub-variable in the *Political Influence*, is *Political Support to Boost Housing Quality in terms of Space Performance* with (RII = 0.770). In accordance to this result, the integrated qualitative findings demonstrated that there is a low degree of government involvement in enforcing the NDSS, in the sense that the new space

standards merely exist to reflect what is happening, instead of driving up the adoption and compliance rates. A possible explanation for this might be that instead of the space standards dictating the trend of things in the housing industry, rather, things or compliance issues are dictating to the space standards and hampering the standards from realising its potential of helping stakeholders deliver better NBHs in England. This probably accounts for the low ranking of the compliance factor as a category. This sub-variable, *Political Support to Boost Housing Quality in terms of Space Performance*, is most likely the reason why the one-way ANOVA test showed that the result was statistically insignificant at 13.0%, thereby nullifying any positive correlation between *Political Influence* and *Spatial Quality of NBHs in England*.

In this study, the two compliance factors that have no positive correlation with the criterion variable are: *Strategic Objectives* and *Political Influence*. Hence, it can be deduced that these factors are directly correlated in the sense that if there is a lack of political will to enforce the NDSS requirements, there will be a lack of cohesive and coordinated strategy to adopt and regulate the compliance activities of spatial requirements for NBHs in England.

The 16th-ranking sub-variable is *Permission to LPA to Adopt the NDSS & Other Space Standards* with (RII = 0.746). This comes as the second sub-variable in the *Political Influence* category, as the Government needs to grant the LPAs enough authority to exercise their regulatory functions. This result is consistent with that of Gallent et al (2010) that space standards adoption has declined because of changes in political priorities, which is a shift from housing quality to housing quantity, and the subsequent diminishing influence of the local authorities over private-sector housing provision. Another possible explanation for this could be that the Government is more interested in the short-term market economic returns housebuilders bring to the country's economy than a mere national space standards adoption, whose economic impact might only be felt in the long-term, thus indirectly favouring the activities of the House Developers over the LPAs'. According to the integrated qualitative finding, some LPAs have tried to set their own standards that are not viable to build in an open housing market, which have further distorted the market across local authorities in the country. Hence, it has been suggested LPAs are to develop sound local plan for NDSS adoption in their areas, while wielding influence over Developers to comply.

The 22nd-ranking sub-variable, and the third sub-variable in the *Political Influence* category, is *Role of Government Incentives on Adoption Rate of Space Standards* with (RII = 0.726). This

result is in tandem with the findings of DLA (2015) who revealed that, in the UK, the private sector of the housebuilding sector has been incapable of delivering decent, *spacious*, quality homes to working class households; meaning – low rents called for low investments, leading to poor housing quality as a result. The UK Government was therefore compelled to introduce several regulations and incentives including subsidy and council house building schemes to deliver a good standard NBH product for working households (DLA, 2015). This result is lowly ranked because the integrated qualitative findings explain that there is a lack of political will to enforce that private developers build bigger homes because there are no incentives for Developers to adopt the space standard.

The 30th-ranking sub-variable, and the fourth sub-variable in the *Political Influence* category, is *Government Hesitancy of Direct Enforcement of Space Standards* with (RII = 0.661). This comes as a low-ranking political influence sub-variable in the entire study, since the Government is reluctant to enforce a nationwide housing space standard. This is explained by Peaker's (2014) assertion that the UK Government maintains a hands-off approach, making the NDSS requirement optional for LPAs to use in their local communities by justifying its application according to evidenced local needs and viability testing. This result is also consistent with the integrated qualitative finding that there is a general opinion that the relatively new space standard (NDSS) is aspirational. The key issue is that the NDSS are only optional rather than mandatory. There is currently a low uptake and little uniformity of space standards in the industry, despite Government's efforts. A lack of uniformity causes the less economically viable cities to be places of less choice and investment.

The 38th-ranking sub-variable, and the fifth sub-variable in the *Political Influence* category, is *Heavy Government Restriction on Land Supply for Sufficient NHB Development* with (RII = 0.577). This finding is buttressed by the fact that land shortages is one of the constraints impinging on the English housing sector (CLG, 2010). Morgan and Cruickshank (2014) also alluded to this that the UK has the smallest homes by floor area in Europe due to a number of reasons including the high value of land. This invariably affects the amount of land allocated to developers, who in turn cut down on the internal spaces of NBHs developed.

6.2.6. The Influence of Market Influence on Spatial Quality of NBHs

The results of this study indicate that *Market Influence* was found to be the least-ranking compliance factor with an aggregated relative importance index (RII = 0.671).

The 15th-ranking sub-variable, and the first sub-variable in the *Market Influence* category, is *Development of Housing Typologies Enhances Varied Customer Alternatives* with (RII = 0.766). This sub-variable holds the highest RII in this category, hence the most crucial for consideration in this research study. This result supports evidence from literature findings of Carmona, et al (2010), that there is a strong link between space and density, which is achievable via specific housing typologies of a certain kind of apartment buildings. There is also literature evidence from DWELL (2016), that a Mid-rise typology is required to achieve an appropriate and balanced indicative housing density in the neighbourhood, while providing reasonably spacious and quality homes that meet the NDSS requirements. The findings of CABE (2005) also agreed to the fact that Mid-rise, high density residential buildings (of about 3 – 4 storeys) provide the opportunity of maximising density while reducing overcrowding to the end-users at the same time. The rationale given above is probably the reason why this sub-variable ranks first in the *Market Influence* category.

The 19th-ranking sub-variable, and the second sub-variable in the *Market Influence* category, is *Stakeholder Consensus on Planning Enforcement & Space Standards Adoption* with (RII = 0.734). This result is an indirect implication of the findings of Gallent, et al (2010), that many forces are at play that shape and influence housing products; albeit, stricter regulation and market economics continue to play a leading role in the delivery of local products that may even exceed the minimum gross internal floor area. However, a stricter regulation leading to a vibrant housing market economy is not going to be possible without an effective stakeholder consensus on planning enforcement and space standards adoption.

The 23rd-ranking sub-variable, and the third sub-variable in the *Market Influence* category, is *Development of High-Quality Space Compliant NBHs Enhances Market* with (RII = 0.706). This result is conversely related to the findings of Gallent, et al (2010), that in today's England, the housing market influences what is built, or more appropriately put – Space Standards are influenced by what the people are willing to purchase. This is a classic scenario of "the tail wags the dog". In an ideal setting, the Space Standards should be the influencer or driver of the housing market, not the other way around, to attain the desired results of sustainable housing

delivery. This might be the plausible explanation why the *Market Influence* category is the least-ranking compliance factor of the research study.

The 26th-ranking sub-variable, and the fourth sub-variable in the *Market Influence* category, is *Reproducibility of Housing Typologies Enhances Space Standard Adoption* with (RII = 0.669). This result is supported by the findings of DWELL (2016) that due to the scarcity of land supply and the pressing housing supply problem in England, some housing typologies are required to achieve an appropriate and balanced indicative housing density in the neighbourhood, while providing reasonably spacious and quality homes that meet the NDSS requirements. In a similar vein, the result agrees with Carmona, et al (2010) who maintained that there is a strong link between space and density, which is achievable via specific housing typologies of mid-rise or high-rise apartment buildings. Furthermore, this result is supported by the integrated qualitative findings in that it was suggested that developers need to consider modern methods of construction, since these lead to reproducibility of NBHs, thereby enhancing compliance with space standards, while developmental costs are more easily controlled.

The 34th-ranking sub-variable, and the fifth sub-variable in the *Market Influence* category, is *Private Sector Interference of Regulatory Decision* with (RII = 0.653). This result is explained by the literature findings of Fisman and Miguel (2007) that the compliance theory furnishes a logical and consistent account for stakeholders' tendency to pursue several heterogeneous goals at the same time. For instance, the housing stakeholders in the private sector may be aspiring to maximise profit, safeguard itself against a hazard, and act appropriately in compliance to regulatory decision, all at the same time. This in effect interferes or lessens the impact of any regulatory compliance efforts between the housing stakeholders and the local planning authorities in the industry. More specifically, there is an interference in policies enacted by the English government in the sense that the government advocates for increasing housing densities and would get involved in communities where the density is less than 30 dwellings per hectare to salvage the situation to the detriment of existing space standards. The outcome of this policy interference is that house developers have misconstrued and exploited the situation to mean that increased housing density is the same as decreased floor space of NBHs (HATC, 2006).

The 35th-ranking sub-variable, and the sixth sub-variable in the *Market Influence* category, is *Public Influence on Housing Developers to Adopt Space Standards* with (RII = 0.641). This result is buttressed by the findings that when the housing end-users of the public become fully aware of the loss of benefits that accompany reduction of space in new homes, such as general health and wellbeing, family life and children, productivity, adaptability, inclusive homes, anti-social behaviour, better quality homes, etc, they will begin to demand and advocate that Housing Developers build NBHs according to stipulated spatial requirements (HATC, 2006; London Housing Strategy, 2010; Cassen and Kingdon, 2007; CABE, 2009; Hanson, 2001; Gallent et al., 2010).

The 36th-ranking sub-variable, and the seventh sub-variable in the *Market Influence* category, is *Development of Spatially Compliant NBHs Increases Profit for Housing Developers* with (RII = 0.633). This sub-variable is closely related to the 35th-ranking sub-variable above such that when clients and end-users are satisfied with the spatial quality of NBHs, it would create a huge demand that will maximise profit-making for the Developers (Gallent et al, 2010; Surin, 2016). Furthermore, this result is justified by the integrated qualitative findings such that when developers consider modern methods of construction, this leads to reproducibility of NBHs, enhancement of spatial compliance, reduction of developmental costs, and maximisation of profit-making. This sub-variable is lowly ranked because it is directly dependent on the 26th sub-variable of reproducibility of housing typologies to have an influence on profit-making for developers. Furthermore, as rents and the buying markets are regulated, increased spatial requirements will lead to increased costs, meaning increased profits. Increased spatial requirements will also lead to increased demand, and increased profits.

The 39th-ranking sub-variable, and the eighth sub-variable in the *Market Influence* category, is *Marketing of New House Sizes by Bedroom Number* with (RII = 0.569). This is the lowest-ranking sub-variable of the entire research study. This result is consistent with the literature findings, which revealed that as housing space standards and policy frameworks changed over the years (since the 1918 Tudor Walters Report when the metric was *number of bedrooms*), the metrics used to quantify spaces within NBHs have also evolved. Efforts were evidently taken in the process of this evolution to curb the non-compliance of stakeholders with various housing space standards used per time by revising the space metrics to easily track compliance violations. Therefore, in these current times the evolution led to the metric of *gross internal*

area of bedrooms, measured in m^2, which is more widely acceptable by all stakeholders of the planning and housing industry (Vale, 2002; Gallent, et al, 2010; Park, 2017). Furthermore, it is understandable why this sub-variable is ranked lowest. The integrated qualitative findings confirmed that the marketing of new house sizes by the number of bedrooms is abysmal for the luxury market. Developers will rather sell NBHs by bedroom floor sizes, which makes the NDSS mandatory and acceptable, except for the niche luxury market where some housebuilders build above the NDSS to meet the ever-growing demand by overseas market for oversized luxury dwellings.

6.2.7. The Influence of Compliance Outcomes on Spatial Quality of NBHs

The finding to emerged from this study is that *Compliance Outcome* was the fifth-ranking compliance factor and aggregated relative importance index (RII = 0.720).

The 8th-ranking sub-variable, and the first sub-variable in the *Compliance Outcomes* category, is *Space Standards Adoption Improves Residents' Quality of Life (Space, Accessibility, etc.)* with (RII = 0.794). This is the Criterion Variable that was used against the other Predictor Variables using the One-way ANOVA hypothesis test; therefore, there is no need for this sub-variable to be discussed (*See Section 5.4.11*).

The 9th-ranking sub-variable, and the second sub-variable in the *Compliance Outcomes* category, is *Space Standards' Joint Adoption with Building Regulation & Other Standards Yields Better Benefits* with (RII = 0.794). This is also a top-ranking sub-variable of the category. This may be explained by the fact that according to DCLG (2015b), there is a heightened expectation that the space standard might be incorporated into the Building Regulations 2010. HATC (2006) also agreed that the Building Regulations is an apparatus and the most reasonable option with which space standards could be established.

The 24th-ranking sub-variable, and the third in the *Compliance Outcomes* category, is *Countrywide Adoption of Uniform Space Standards Enhances Equal Opportunities* with (RII = 0.694). This result supports evidence from literature findings of DCLG (2014), that the new space standard (NDSS) was developed to rationalise all existing space standards into a single national compliance approach, with the intent of ensuring that NBHs across the England are highly functional in terms of meeting typical day to day needs at a given level of occupancy. The result is a true evaluation of its low ranking because according to the integrated qualitative

findings, one of the sub-factors militating against compliance is that development costs vary across the UK, hence the difficulty to enforce a common space standard.

The 29th-ranking sub-variable, and the fourth sub-variable in the *Compliance Outcomes* category, is *Space Standards Support by Procurement & Management Plans* with (RII = 0.661). This result supports evidence from LDA (2010), that in terms of delivering value, spatial requirements, or space standards on their own, are not a guarantee of housing quality delivery; instead, they should be supported by viable procurement methods and long-term management methodologies available. This low-ranking result was also supported by the integrated qualitative finding such that across local authorities, it was found that the approach to HSS adoption for new build housing varies for several reasons. For instance, different delivery mechanisms or procurement routes employed by the developer affect HSS adoption such that some of the NBHs acquired or directly delivered by the developer may or not meet the required standards.

The 33rd-ranking sub-variable, and the fifth sub-variable in the *Compliance Outcomes* category, is *Development of Value-driven Methodology for Evaluation of Housing Quality* with (RII = 0.657). This result is consistent with the literature findings that at the higher end of the housing market, some of the larger housebuilders, clients, investors use collaborative platforms and value-driven methodologies especially for mega-sized construction projects. This does not really impact the compliance problem of spatial requirements because majority of new build housing schemes in England are small-scale developments, thus not requiring collaborative platforms or value-driven methodologies to evaluate housing quality (Wilkinson, 2016).

6.3. SUMMARY

The research implications of the results of relative importance indices and hypotheses testing from Chapter 5 was discussed in detail. The discussion of findings covered all sub-variables (including the correlation between the least sub-variables and the regulatory compliance problem) across all the categories for the sake of enrichment and completion, and their implications highlighted. In general terms, the research findings emerging from the testing of associations of the various factors influencing compliance with HSS requirements in England, in line with Objective 4 of the study, include the following: that there is no positive correlation

between *Strategic Objectives* and *Spatial Quality of NBHs* in England; that there is a positive correlation between *Responsibilities, Skills & Expertise* and *Spatial Quality of NBHs*; that there is a positive correlation between *Effective Collaboration & Stakeholder Adoption* and *Spatial Quality of NBHs*; that there is a positive correlation between *Compliance Process & Technology Integration* and *Spatial Quality of NBHs*; that there is no positive correlation between *Political Influence* and *Spatial Quality* of NBHs; that there is a positive correlation between *Market Influence* and *Spatial Quality of NBHs*; and finally that there is a positive correlation between *Compliance Outcomes* and *Spatial Quality of NBHs in England.* Therefore, the completion of this chapter fulfils the achievement of both the 4th objectives of the research study.

CHAPTER 7

RECOMMENDATIONS, CONCLUSIONS AND LIMITATIONS OF THE STUDY

7.1. INTRODUCTION

This chapter presents the recommendations to the UK Government, the planning and housing stakeholders in the industry. Conclusions reflecting the achievement of research objectives were drawn from all the phases of the research study, and the limitations encountered during the course of the study were presented.

7.2. RECOMMENDATIONS

The discussion of research findings about the influences of the respective compliance factors on the spatial quality of NBHs culminated in some relevant recommendations that the Local Planning Authorities, Housing Associations, House Developers, and the Government will find applicable for the enhancement of housing growth and delivery in the United Kingdom.

7.2.1. Recommendations for the UK Government

It is hoped that the move by the UK Government to streamline and simplify the planning process for creating quality, new build housing would be sustained in England. This recommendation originated from the *Strategic Objectives* category of stakeholders to create enabling and sustainable local communities (*See 2nd-ranking sub-variable in Section 6.2.1*). It is also recommended that the Government would grant more permission to the LPAs to adopt the NDSS and exercise more influence over private-sector housing provision. This recommendation originated from the *Political Influence* category, such that space standards adoption has declined due to change in political priorities from housing quality to housing quantity, and the subsequent diminishing influence of the LPAs over private-sector housing provision (*See 16th-ranking sub-variable in Section 6.2.5*).

It is recommended that the UK Government would provide incentives to all segments of the society to be able to afford a good standard NBH product of their choice; that way the new build housing market would expand, and the adoption and compliance rate of space standards

would improve. This recommendation came from the result of the *Political Influence* category, emphasising the role of Government incentives on adoption rate of space standards, and a renewed political will to encourage private developers to build spatially compliant homes (*See 22nd-ranking sub-variable in Section 6.2.5*).

The UK Government has the moral obligation to engender an effective all-stakeholder consensus on planning enforcement and space standards adoption, that will enhance a stricter regulation leading to a more vibrant housing market economy. This recommendation emerged from the result of the *Market Influence* category, which recognised the interplay of market forces that shape and influence housing products. Albeit, a stricter regulation leading to a vibrant housing market economy would not be possible without an effective stakeholder consensus on planning enforcement and space standards adoption (*See 19th-ranking sub-variable in Section 6.2.6*).

It would be commendable if the NDSS could be incorporated into the 2010 Building Regulations. This move will undoubtedly provide the regulation and certainty that the housing industry of planning and housebuilding stakeholders are looking forward to. This recommendation originated from the *Compliance Outcomes* category, asserting that the Building Regulations is the most reasonable apparatus through which space standards could be established across the United Kingdom (*See 9th-ranking sub-variable in Section 6.2.7*).

The Government should not just maintain a hands-off approach by merely establishing the NDSS requirements in the Building Regulations; instead, it should innovate viable procurement methods and long-term management methodologies that are NDSS-compatible, for an enhanced delivery of housing quality for the industry. This recommendation arose from the *Compliance Outcomes* category; since it was found that procurement and management methodologies varied across small, medium, and large developers, it will make sense for the Government to innovate a uniform array of viable procurement methods and long-term management methodologies for all house developers in the country (*See 30th-ranking sub-variable in Section 6.2.7*).

7.2.2. Recommendations for the Local Planning Authorities

The development of any Local Plan or supplementary guidance document should be informed by the strategic decision to maximise *space* to define end-user's requirements and functions of

the building, thereby identifying what space is required to successfully meet the functional needs of end-users. This recommendation emerged from the *Strategic Objectives* category, since the LPAs are saddled with the strategic role of identifying what space is required by rooms or new dwellings to successfully meet the functional needs of end-users (*See 4th-ranking sub-variable in Section 6.2.1*).

LPAs in England should endeavour to consciously set out to establish and refine the requirements for the Gross Internal Areas of new dwellings at a defined level of occupancy as well as floor areas and dimensions for key parts of the home, especially spaces like bedrooms, storages, and floor to ceiling height. This recommendation emanated from the *Strategic Objectives* category, such that LPAs are encouraged to establish clear requirements for GIA of new dwellings (*See 3rd-ranking sub-variable in Section 6.2.1*).

It is highly recommended that LPAs should develop a control mechanism typical of their community, to manage the regulatory requirements for unit mix housing typologies and prevent any irregular practices in the marketing of NBHs to end-users. This recommendation originated from the *Strategic Objectives* category, such that LPAs are persuaded to step up their efforts to curb any ambiguity or irregularity that may arise from the housing stakeholders (*See 3rd-ranking sub-variable in Section 6.2.1*).

The LPAs should enhance their control mechanism to effectively coordinate the adoption of, compliance with, and enforcement of space standards, so as to forestall any clashes of roles between the planning and the building control departments in the discharge of their responsibilities. They should be able to reach a consensus as per when to invite the building control department for the checking of spatial requirements of specific development proposals. This recommendation arose from the *Responsibilities, etc.* category, since the compliance and enforcement actions primarily lie with the LPAs (*See 5th-ranking sub-variable in Section 6.2.2*).

For an effective coordination of adoption and compliance with the NDSS requirements, the NPPF document should be applied in each local council community to demonstrate local need of the community as part of the Local Plan development for delivery of NBHs in England. This recommendation emerged from the *Responsibilities, etc.* category, in that the LPAs are in the most suitable position to adopt the NPPF for local plan policy guidance in local communities (*See 11th-ranking sub-variable in Section 6.2.2*).

It is suggested that there should be a regular stakeholder review and consolidation process to constantly examine the rationale behind space standards, housing conditions, and provide evidence of the benefits of floor space standards for NBHs. This recommendation came from the *Responsibilities, etc*. category, since it was found that this activity of reviewing housing conditions of a proposed dwelling, is less frequently performed by the local planning officials (*See 31st-ranking sub-variable in Section 6.2.2*).

LPAs are recommended to adopt new technologies in order to overcome such difficulties as ensuring effective compliance, making decisions on the level of checking to be performed, checking whether the building information supplied by developers are accurate, and minimising the administrative bottlenecks experienced by applicants when providing information about their plan applications. This recommendation originated from the *Compliance Process, etc*. category, which promotes the application of new technologies to enhance adoption of space standards for new dwellings, since *space* has become a more important concept in computer-based information systems of building design, construction, and management (*See 28th-ranking sub-variable in Section 6.2.4*).

The Building Control department, overseeing the checking of compliance violations and building control measures, should work hand in hand with the Planning and Housing Standards departments for a more seamless coordination of compliance activities. This recommendation arose from the *Effective Collaboration, etc*. category, maintaining that an early engagement of all stakeholders is crucial for the effective coordination of the planning application system, and during the early stages of development proposals (*See 14th-ranking sub-variable in Section 6.2.3*).

7.2.3. Recommendations for the Housing Associations and House Developers

In the best interest of all stakeholders and collective effort of sustainability, Housing Associations and House Developers should endeavour to refrain from exploiting the market for profit alone. Housing stakeholders should respect and adhere to laid down guidelines and regulatory requirements for unit mix of apartment building typology; that way they would make the profits they so desire and make the investors happy in the end. This recommendation emerged from the *Market Influence* category, in that it was found that there is a strong link between space and density, achievable through specific housing typologies of a certain kind of buildings. Thus, achieving a balanced indicative housing density in a community, maximising

profit and keeping investors and shareholders happy, while providing reasonably spacious and quality homes that meet the NDSS requirements (*See 15th-ranking sub-variable in Section 6.2.6*).

It is recommended to house developers and designers that Space Standards should be adhered to; and that Space be maximally explored to make available possibilities of greater design and layout arrangement for enhanced delivery of NBHs. This recommendation came from the *Responsibilities, etc.* category, such that compliance with space standards creates room for long-term usability and adaptability in the later life cycle use of a dwelling (*See 32nd-ranking sub-variable in Section 6.2.2*).

Housing stakeholders are encouraged to participate and cooperate fully in an open, level playing field of all stakeholders for the adoption of uniform space standards; as this has the potential of enabling the house developer to achieve housing quality, to easily follow fundamental minimum requirements, and to benefit immensely from increased certainty in housing delivery. This recommendation originated from the *Effective Collaboration, etc.* category, buttressing the fact that an effective collaboration among planning and housing stakeholders is enhanced when there is an open, transparent, and fair communication based on governmental policy documents (*See 6th-ranking sub-variable in Section 6.2.3*).

It is suggested that housing stakeholders should complement their adoption of space standards with enhanced effectiveness of site planning, and precision of construction techniques to achieve design quality of NBHs. This recommendation arose from the *Compliance Process, etc.* category; in the sense that adoption of space standards is not sufficient to achieve a standard design quality alone but should be complemented with effective site planning and construction techniques to achieve design quality of NBHs (*See 7th-ranking sub-variable in Section 6.2.4*).

Housing stakeholders are recommended to adopt state-of-the-art technologies in order to overcome such difficulties of taking 3 minutes or more per dwelling to supply building information with the use of CAD to the planning authorities. This recommendation originated from the *Compliance Process, etc*. category, which promotes the application of new technologies to enhance adoption of space standards for new dwellings, since the utilisation of BIM at the design and developmental phases has been found to have the potential of enhancing adoption of space standards for NBHs in the United Kingdom (*See 28th-ranking sub-variable in Section 6.2.4*).

It is recommended to housing stakeholders that they should commit a sizeable percentage of their housing provision stock to the Mid-rise typology, to achieve an appropriate and balanced indicative housing density in the neighbourhood, while providing reasonably spacious and quality homes that meet the NDSS requirements. A Mid-rise typology investment has the potential of benefiting the housebuilder in a number of ways: reduction of cost of land acquisition; reduction in the cost of lift installation and other services; provision of housing flexibility over its life span; creation of cost-effective building patterns, such as block of flats; increased turnover and profit, etc. This recommendation also emerged from *Market Influence* category, buttressing the fact that a Mid-rise typology, a high-density residential building (of about 3-4 storeys), provides the opportunity of maximising density while reducing overcrowding to the end-users at the same time. Therefore, achieving a balanced indicative housing density in a community via modern methods of construction; thus, leading to reproducibility of NBHs, enhancing compliance with space standards, and controlling developmental costs much more easily (*See 26th-ranking sub-variable in Section 6.2.6*).

7.3. CONCLUSIONS

This section presents the main findings and conclusions in the order of achievement of research objectives for the study.

7.3.1. General Literature Review of Compliance Frameworks Across Industries

The first research objective was to conduct an in-depth review examining existent literature as applied in the discussion about the compliance factors of housing space standards for New Build Homes in England. To achieve Objective 1, a comprehensive literature review was adopted as secondary data, sourced from relevant academic journals, technical papers, and online materials, to provide understanding on terminologies such as compliance, compliance theory, regulatory compliance, corporate compliance, compliance framework, compliance factors, spatial requirements, new build homes, and understanding on the global housebuilding industry. This review led to a thematic analysis of selected compliance frameworks across industries ranging from financial, insurance, healthcare, IT, regulatory, non-profit organisations, etc. The thematic analysis of these compliance frameworks helped to uncover elements of compliance factors embedded within the frameworks, which were listed as *Strategy*, *Communication*, *Responsibility*, *Technology*, and *Value* in order of ranking. These

elements of compliance factors became the constructs upon which the research study for regulatory compliance of housing space standards was empirically built.

Therefore, *Objective 1*, which set out to conduct an in-depth review examining existent literature as applied in the discussion about the compliance factors of housing space standards for New Build Homes in England, was deemed to be successfully achieved.

7.3.2. Thematic Analysis of Housing Space Standards and Semi-structured Interviews

The second research objective was to conduct a detailed analysis of policy documents and interviews in order to understand the factors influencing the compliance with housing space standards requirements in England. Objective 2 is in two parts. To achieve Part A of Objective 2, a thematic analysis approach using the Braun and Clarke's 6-step process was employed to examine government policy frameworks and housing space standards used in England. This led to a vast array of compliance codes and categories for the development of themes for compliance factors influencing adoption of spatial requirements for New Build Homes in England. The findings of Part A of this objective were found to be the following 7 categories in this order: (1) *Strategic Objectives*, (2) *Responsibilities*, (3) *Communication*, (4) *Technology*, (5) *Political Influence*, (6) *Market Influence*, and (7) *Value*.

To achieve Part B of Objective 2, a thematic analysis approach using the Braun and Clarke's 6-step process was also employed to examine the semi-structured interview transcripts of local planning officials. The same approach was utilised in uncovering the heterogeneous and plural goals or motivations of all stakeholders through a thematic analysis of semi-structured interviews, which revealed the various sub-factors and variables that influence the regulatory compliance with these standards and policies. The findings of Part B of this objective were found to be the following 7 categories, with slight modifications due to emergence of data from a further thematic analysis in this order: (1) *Strategic Objectives*; (2) *Responsibilities, Skills & Expertise*; (3) *Effective Collaboration & Stakeholder Adoption*; (4) *Compliance Process & Technology Integration*; (5) *Political Influence*; (6) *Market Influence*; and (7) *Compliance Outcomes*. These 7 categories were found to be more refined than the previous set of equal number of categories.

The findings of the thematic analysis of housing space standards and the semi-structured interviews with local planning officials corroborate the earlier literature review's supposition that there was an overarching knowledge gap between the spatial compliance and the spatial quality in the planning system and housebuilding sectors of the housing industry in England.

Therefore, *Objective 2*, which set out to conduct a detailed analysis of policy documents and interviews in order to understand the factors influencing the compliance with housing space standards requirements in England., was deemed to be successfully achieved.

7.3.3. Questionnaire Survey for Identification of Key Compliance Factors

The third objective was to identify key factors that influence the regulation of housing space standards requirements for the English housing industry. The previous categories from the previous objective were enlisted in the achievement of this objective as: (1) *Strategic Objectives*; (2) *Responsibilities, Skills & Expertise*; (3) *Effective Collaboration & Stakeholder Adoption*; (4) *Compliance Process & Technology Integration*; (5) *Political Influence*; (6) *Market Influence*; and (7) *Compliance Outcomes*. However, this time around the 39 sub-variables of the categories listed above were subjected to a carefully selected and systematic combination of quantitative techniques that were used to identify the most influential factors affecting compliance with house space standards for NBHs in England. The *Cronbach's alpha* technique was applied to validate the reliability of each compliance factor category and the entire questionnaire survey instrument. In an effort to empirically investigate the compliance factors and provide understanding of the extent of influence of each sub-variable on the adoption of spatial requirements for NBHs, the *Relative Importance Index* technique was utilised to evaluate and rank the 39-compliance factor sub-variables. The output of this technique was a *Compliance Factors Chart* with a revised ranking in this order: (1) S*trategic Objectives*; (2) *Responsibilities, Skills & Expertise*; (3) *Effective Collaboration & Stakeholder Adoption*; (4) *Compliance Process & Technology Integration*; (5) *Compliance Outcomes*; (6) *Political Influence*; and (7) *Market Influence.*

Therefore, *Objective 3*, which set out to refine the compliance factors influencing the regulation of space standards requirements for the English housing industry, was deemed to be successfully accomplished.

7.3.4. Hypothesis Testing of Compliance Factors and Research Findings

The fourth objective was to test the association of the various factors influencing compliance with the housing space standards requirements in the English housing industry. The One-way ANOVA technique was utilised to accept or reject hypotheses of the correlation between each of the compliance factors sub-variables against the selected criterion variable. Testing for the equality of variance seemed to apply closely to achieving this research objective because of the presence of multiple independent variables (of compliance factors) seeking to predict the influence of one independent variable at a time on the dependent or criterion variable (i.e. spatial quality of NBHs). The compliance factor categories such as *Responsibilities, Skills & Expertise*; *Effective Collaboration & Stakeholder Adoption*; *Compliance Process & Technology Integration*; *Compliance Outcomes*; *Political Influence*; and *Market Influence* were tested positive in correlation with *Spatial Quality of NBHs*. The positive correlation of the compliance factor categories with the criterion variable led to a detailed discussion of findings at the sub-variable level of information.

Contrariwise, the findings also indicated that of all the compliance factor categories tested, *Strategic Objectives* and *Political Influence* were found to have a negative correlation with *Spatial Quality of NBHs*. This was found to be conflicting because, for instance, the *Strategic Objectives* category, which was ranked the most influential compliance factor, ironically had no positive relationship with *Spatial Quality of NHB* in England. However, an interpretation of the correlation between *Strategic Objectives* and *Spatial Quality of NBHs* was given, which was mostly due to a loophole exploited by House Developers due to the lack of adequate control mechanism by LPAs for regulatory compliance. Furthermore, since the compliance factor categories of *Strategic Objectives* and *Political Influence* were respectively tested negative in correlation with *Spatial Quality of NBHs*; hence it was deduced that there was a direct correlation between these categories in the sense that if there is a lack of political will by Government to enforce the NDSS requirements nationwide, then there will be a lack of cohesive and coordinated strategy by the LPAs to adopt and regulate the compliance activities of spatial requirements for NBHs in their respective local communities.

Therefore, the *Objective 4*, was deemed to be achieved since the association of the various compliance factor categories influencing the spatial quality of NBHs in the English housing industry was successfully tested.

7.3.5. Recommendations to the UK Government and Key Stakeholders

The fifth objective was to provide recommendations to the stakeholders of the planning and housebuilding sectors of the English housing industry. To conclude the research study, recommendations were provided to the 3 key stakeholders of the planning and housebuilding sectors of the housing industry in line with Objective 5. Many recommendations were made to respective stakeholders, but the ones stated below appeared to have a novel approach and a far-reaching impact on the wider UK housing industry.

The key recommendation that seemed to stand out from the rest for the *UK Government* was the fact that it would be commendable if the NDSS could be incorporated into the 2010 Building Regulations. This move will undoubtedly provide the nationwide regulation and certainty that the housing industry of planning and housebuilding stakeholders are looking forward to, since the Building Regulations is the most reasonable apparatus through which space standards could be established across the United Kingdom. Additionally, since it was found that procurement and management methodologies varied across small, medium, and large developers, it was recommended to the Government to innovate a uniform array of viable procurement methods and long-term management methodologies for all house developers across the country for an enhanced delivery of housing quality in the industry.

The key recommendation that seemed to stand out from the rest for the *Local Planning Authorities* was to adopt new technologies in order to overcome such difficulties as ensuring effective compliance, making decisions on the level of checking to be performed, checking whether the building information supplied by developers are accurate, and minimising the administrative bottlenecks experienced by applicants when providing information about their plan applications. This recommendation hereby promotes the application of new technologies to enhance adoption of space standards for new dwellings, since *space* has become a more important concept in computer-based information systems of building design, construction, and management.

The key recommendation that seemed to stand out from the rest for the *Housing Associations and Developers* was the readiness to adopt state-of-the-art technologies in order to overcome such difficulties of taking 3 minutes or more per dwelling to supply building information with the use of CAD to the planning authorities. This recommendation promotes the application of new technologies to enhance adoption of space standards for new dwellings, since the

utilisation of BIM at the design and developmental phases has been found to have the potential of enhancing adoption of housing space standards for NBHs in the United Kingdom.

7.4. LIMITATIONS OF THE STUDY

The limitations of the research study are listed below:

1. There were only a restricted number of housing space standards and policy frameworks available for a thorough thematic analysis.
2. The researcher should have conducted more semi-structured interviews to further enrich the qualitative research findings. This was due to time restriction. Nonetheless, the open-ended questions as part of the questionnaire survey enhanced the qualitative research outcomes all the same.
3. The researcher should have adopted a complete postal survey (as opposed to the combination of online and postal surveys in the research study) because it yielded a much higher response rate than the combination of the two within a shorter period of time.

7.5 AREAS OF FURTHER RESEARCH

The combination of this research study findings and recommendations provides a viable support for the conceptual premise and development of a compliance framework for achieving space standard compliance and corporate performance of planning and housebuilding organisations in the delivery of New Build Homes in England.

APPENDIX 1: UNIVERSITY ETHICAL APPROVAL

28 July 2016

Farzad Pour Rahimian / Adedotun Ojo
School of Engineering
University of Central Lancashire

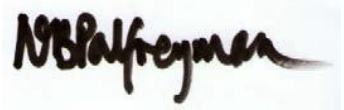
Dear Farzad / Adedotun

Re: BAHSS Ethics Committee Application
Unique Reference Number: **BAHSS 352**

The BAHSS Ethics Committee has granted approval of your proposal application 'KEY COMPLIANCE FACTORS FOR SPATIAL REQUIREMENTS OF NEW BUILD HOMES IN ENGLAND'. Approval is granted up to the end of project date* or for 5 years from the date of this letter, whichever is the longer.

It is your responsibility to ensure that the project is carried out in line with the information provided in the forms you have submitted you regularly re-consider the ethical issues that may be raised in generating and analysing your data any proposed amendments/changes to the project are raised with, and approved, by Committee you notify roffice@uclan.ac.uk if the end date changes or the project does not start serious adverse events that occur from the project are reported to Committee a closure report is submitted to complete the ethics governance procedures (Existing paperwork can be used for this purposes e.g. funder's end of grant report; abstract for student award or NRES final report. If none of these are available use e-Ethics Closure Report Proforma).

Yours sincerely,



Nick Palfreyman
Deputy Vice
Chair
BAHSS Ethics Committee

* for research degree students this will be the final lapse date
NB - Ethical approval is contingent on any health and safety checklists having been completed, and necessary approvals as a result of gained.

APPENDIX 2: INVITATION TO PARTICIPATE IN INTERVIEW

Research Title: Key Compliance Factors of Spatial Requirements for New Build Homes in England

Dear Respondent,

My name is Adedotun Ojo; a research student at the Department of Construction and Civil Engineering, School of Engineering, University of Central Lancashire (UCLan).

You are kindly invited to participate in this research study. As part of requirements for fulfilment of my research objectives, I aim to evaluate the existing requirements of Local Space Standards and Compliance Coordination Drivers experienced by Local Authorities, Developers, and Clients across England. The expected outcome of this study is to develop a conceptual framework of drivers influencing the adoption of Spatial Requirements for new buildings with current Space Standards used in England.

As part of this research, I would be grateful if you could allocate 30 minutes of your valuable time for a face-to-face interview with me, during which you will be invited to answer specific questions regarding the issues surrounding compliance checking of Spatial Requirements of existing and new buildings in England.

If you do decide to participate in this study, please, kindly take some time to fill the attached *Consent Form* and read the *Participant Information Sheet* for details of the research. I would appreciate if you could examine the *Interview Questions*, also attached; and kindly indicate your interest by email and a convenient time for an interview with you. However, if you are not able to arrange a face-to-face meeting with me for some reason, I will be delighted if you could email me the answered questions. A *University Ethical Approval* is also attached.

Thank you very much for your cooperation and please do not hesitate to contact me if you have any questions.

Yours faithfully,

Adedotun Ojo,
Research Student,
School of Engineering,
University of Central Lancashire,
Email: adedotun.ojo@outlook.com

APPENDIX 3: CONSENT FORM – INTERVIEW

Research Topic: Key Compliance Mechanisms of Spatial Requirements for New Build Homes in England

Name, position, and contact address of Researcher:

Adedotun OJO (Research Student),
Department of Construction & Civil Engineering,
School of Engineering, University of Central Lancashire, Preston, PR1 2HE
Email: adedotun.ojo@outlook.com

	Please initiate box with an 'X'
I confirm that I have read and understand the information sheet, dated 28th July 2016 for the above study and have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.	☐
I agree that my data gathered in this study may be stored (after it has been anonymised) in a specialist data centre and may be used for future research.	☐
I understand that it will not be possible to withdraw my data from the study after final analysis has been undertaken.	☐
I agree to the interview being audio recorded.	☐
I agree to the use of anonymised quotes in publications, conference papers, presentations, research reports and research thesis.	☐
I agree to take part in the above study.	☐

Name of Participant	Date	Signature
Name of Researcher	Date	Signature

APPENDIX 4: PARTICIPANT INFORMATION SHEET – INTERVIEW

Research title: Key Compliance Mechanisms of Spatial Requirements for New Build Homes in England

Invitation to take part in this research

You are kindly invited to take part in this research study. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take some time to read the following information carefully.

Purpose of the Study

This research work investigates the compliance of space standards in new build homes in England. Research findings identify the need to streamline and rationalise the numerous space standards and compliance procedures. The expected outcome of this study is to develop a conceptual framework of drivers influencing the adoption of Spatial Requirements for new buildings with current Space Standards used in England.

Research rationale

Space is one of the most important elements of building design to define the users' requirements and functions of a building. The Housing Standards Review, concluded in the early part of 2016, was designed to streamline and simplify the planning process for creating quality and sustainable housing in the UK. Unfortunately, however, it appears to have caused a lot of confusion instead. Unlike other aspects of the Housing Standards Review, the Space Standard is yet to be incorporated into the Building Regulations. Establishing compliance and any enforcement action therefore rests with the Local Planning Authority. However, rather than the existing situation where standards may vary from district to district, there is now a single set of national standards known as the Nationally described Space Standard for England (NdSS). The NdSS, a new Planning Standard, was developed to rationalise existing space standards into a single national approach. The starting point is the need for rooms to be able to accommodate a basic set of furniture, fittings, activity and circulation space appropriate to the function of each room. The standard deals with internal space with new dwellings and is suitable for application across all tenures. It sets out requirements for the Gross Internal Area (GIA) of new dwellings at a defined level of occupancy as well as floor areas and dimensions for key parts of the home, especially bedrooms, storage and floor to ceiling height.

Why have I been invited to participate?

You have been invited to participate in this research because your experience as a member of staff of the Local Planning Authority can make valuable contribution to the body of

knowledge essential for the development of a conceptual framework of drivers influencing the adoption of Spatial Requirements for new buildings with current Space Standards used in England.

What will the study involve?

As part of the research we would like to interview Planning Officers, Building Control Surveyors, Approved Inspectors, Housebuilders, Designers, Property Managers, and Developers, to evaluate existing Space Standards across Local Planning Authorities in England, and also investigate the compliance coordination problem encountered by stakeholders of the housebuilding industry in England.

Do I have to take part?
You do not have to take part. Your participation is entirely voluntary. If you decide to take part you are still free to withdraw at any time and without giving a reason. All information used will be anonymous.

Can I withdraw my data after my participation?
Yes. Participants may request that their data not be used even after undertaking an interview. However, it will not be possible to withdraw anonymised participant information after final analysis has been made.

What will happen to me if I take part?
You will be interviewed. At the start of the interview, your consent will be requested to either audio record or take handwritten notes of the interview for transcription purposes. You will then be given the opportunity to discuss any questions and will be asked to sign a consent form. The interview should take approximately 30 minutes.

Are there any risks or costs associated with the activity?
There are no risks or out of pocket costs associated with this activity. However, your contribution will be in kind in form of staff-time spent undertaking the interview.

Where and when will the interview take place?
The interview will take place in your office or in your premises designated by you at a time previously agreed with you.

What are the possible benefits of taking part?
You will be able to inform the research by sharing your experience, as a member of staff. Your views and opinions will contribute to the development of a conceptual framework to aid in the checking, managing and evaluating of space requirements of buildings in the UK.

Will what I say in this study be kept confidential?
All information collected during the session will be kept strictly confidential (subject to legal limitations). Confidentiality, privacy and anonymity will be ensured in the collection, storage and publication of research material in accordance with the University's policy on Academic Integrity. All data collected, as part of this research, will be kept securely in paper or electronic form for 5 years, and will then be destroyed.

What should I do if I want to take part?
All you need to do is indicate your interest to participate to the Researcher by email on adedotun.ojo@outlook.com . We shall then contact you to agree on a time that is convenient for you to be interviewed.

What will happen to the results of the research study?
The results of the interviews will be analysed and validated against other evidenced-based research findings in order to develop a conceptual framework to aid in the checking, managing and evaluating of space requirements of buildings in the UK. It will be reported in the research thesis and a paper will be published in an academic journal.

Who is supporting the research?
This research is supported by the Department of Construction and Civil Engineering, School of Engineering at the University of Central Lancashire.

Who has reviewed the study?

The University Research Ethics Committee has approved this research.

Contact for Further Information
If you have questions about this study and the interview, please contact:

Dr Stanley Njuangang

Lecturer in Construction

School of Engineering

University of Central Lancashire, Preston PR1 2HE

Telephone: 01772894214

Email: snjuangang1@uclan.ac.uk

Dr. Godfaurd John
Lecturer in Project Management

School of Engineering

University of Central Lancashire, Preston PR1 2HE

Telephone: 01772893227

Email: gajohn@uclan.ac.uk

What do I do if I have any issues or complaints?

If you have any complaints about this research or researchers, please contact:

Dr. Champika Liyanage

Reader in Facilities Management

School of Engineering

Office HB242, Harris Building

University of Central Lancashire

T: 01772 893221

E: clliyanage@uclan.ac.uk

Thank you for taking the time to read this participant information sheet.

Yours sincerely,

Adedotun OJO,

School of Engineering,

University of Central Lancashire

Email: adedotun.ojo@outlook.com

APPENDIX 5: INTERVIEW QUESTIONS

RESEARCH TOPIC: Key Compliance Mechanisms for Spatial Requirements of New Build Homes in England

INTERVIEW QUESTIONS:

Compliance Questions:

1. What *existing space standard* is adopted by your organisation for the compliance and coordination of spatial requirements of New Build Homes in your locale?
2. What are the compliance *strategic objectives* for implementing space standards in your organisation?
3. What are the *responsibilities* of all participants required for an effective coordination of [spatial] compliance activities in your organisation?
4. What are the *communication* methods or tools used for the compliance of space standards for New Build Homes?
5. What are the *technological* methods or tools used for the compliance of your space standard process and technology integration entail in your organisation?
6. What are the prevailing *political* influences surrounding the adoption of your chosen Space Standard for the development of New Build Homes in your locale?
7. What are the prevailing *market* influences surrounding the adoption of your chosen Space Standard for the development of New Build Homes in your locale?
8. What is the *value* derived in terms of benefits or outcomes from compliance of space standards for New Build Homes in your locale?
9. Are there any other comments you would like to add or directed reading to be considered?

APPENDIX 6: SAMPLE INTERVIEW TRANSCRIPT

Introduction

Adey: It's more like a pilot study just to set the ball rolling and I want to know if the Planning Department is the best department to tackle these questions.

Les: I don't know how much you know already how the Council operates in regard to housing and space standards. What we have in the council is the team that we call Housing Standards comes under Environmental Health; and what we deal with are mostly existing buildings that have been subdivided and converted in some way…The council also talks about environmental health. We enforce Housing Standards, including Space standards…Your questions are more aimed at the Planning Department. Planning can set the rules, but if someone does something outside those rules, then Housing department comes in.

Adey: Let's still proceed with the questions, so the Planning Department will be a second respondent, and will make the research richer.

Les: Your research is more aimed at him.

What *existing space standard* is adopted by your organisation for the compliance and coordination of spatial requirements of New Build Homes in your locale?

Les: Your very first question: What is the domestic Space Standard adopted...? We tend to use the old standard derived from the *Part 10 of the Housing Act of 1985*. Within that Part 10 that derives from older Housing Acts going back right into the 1930s, which tells the Council what the minimum requirements are for bedrooms effectively

What are the compliance *strategic objectives* for implementing space standards in your organisation?

Les: It's mostly aimed at people's spaces inside their bedrooms, and it sets clear guidelines per child, a baby, for adults or 2 adults, etc. And you know that's something we stick to for bedroom standards. On top of that, we have Case Law, precedent law from Housing Act cases…which says what we expect to see in terms of other parts of accommodation, sizes for bathrooms, sizes for kitchen, and sizes for lounges, etc. So what we do with those (and I can provide you with this after the meeting. I will send you an email) is we have a set of documents which says these are minimum room sizes that I look to see when I have a planning application come across the table to me or local properties that a bit competitive. But what I have got to tell you Ojo, is there are a lot smaller than what is in there (NDSS document), (Laughs). It's quite surprising really (sighs). What we tend to look for is we have some room sizes that are all engrained in your head, so minimum sizes for an adult (6.5 m^2) when they have an additional lounge; if they haven't got a lounge to go into of a certain size, then we are looking at a minimum of 10 or $10^{1/4}$ m^2 . All these are kind of enshrined in the Environmental Health Policy and then what we enforce to, so you bring a drawing to me and you say that's my design for this, well my bedroom is undersized and so we need to make it bigger, the kitchen is small, it's not going be safe and suitable for use. I now look at those rooms and say those

need to be changed. Very often, development is like lots of people tend to use small space, get the most out a building, and the most out of the money they've put into it. And it's my job and Planning as well to push that back to say: No, these are the minimum standards we are going to adhere to. Like I said, we won't be looking for 37m^2 for a one-bedroom flat, we will be looking for something around 24 or 25m^2. I could give you those…

Adey: So you said that's the Case Law and the Housing Act?

Les: It's derived from lots and lots of cases that have come to tribunals and magistrate courts in the old days, which said or well the people said the council's view is this, the Environmental Health view is this, the opponent's view is this, and lots of people have said, No the minimum size you need for this kind of thing is this size. But again, I don't know, in the Modern housing Act of 2004, what it says in terms of space standards of properties is that it must be safe and healthy to live in. It makes reference to the earlier Act of 1985, but it doesn't set minimum sizes or standards or we going to write it down in black and white. So what it does is, it leaves it up to the person who is assessing the property or who's assessing the plans to say is it safe or not. So it gives a leeway. So have a clever building or a very nice conversion but it has one element of not very nice, perhaps it's a small kitchen or bedroom, etc. So what you can say is this is a lovely flat or house, it's got all these nice things going on like nice views, good window standards, etc. So going back to your question, the domestic space standard is derived from Housing Act of 1985.

Les: the net internal space requirements for key parts of the home? What I am going to do Ojo is I'm going to send you the document on our website. On there what we have is. We have a set of design rules mostly centred on small flats (for new-build homes or conversions). Minimum size for that, minimum size for this. What we use are those standards talked about in number one, so we look at the plans and sizes of the property whether small or big sizes. Erm so that's how the compliance aspect (part of it) works.

Adey: What is the title of the document?

Les: Em! I think it's just called Housing Standards; I think it's called Landlord's Guide or something like that because most of them are rented property. Moving on to Q3.

What are the *responsibilities* of all participants required for an effective coordination of [spatial] compliance activities in your organisation?

Les: What happens is when the Planning team get a job or a referral of plans and drawings, etc., it is, if it is intended for owner occupation, I don't tend to see them, Planning department deals with them; if it is intended for interviews, and it's clear that it is soon as People building blocks of flats, people converting existing buildings, people building student accommodation, etc. they always come to me as a matter of course. And then one of my team takes those plans, looks at them, measures the rooms, compares the layout, and makes a judgement about them. What happens is that they get a formal response from us which is added to the planning process; and we say we don't accept that room, we don't like that room, we don't like this part of the building. Em! It's not just about Space Standards, we look at everything, we look at natural light provision, we always insist on natural lights for habitable rooms. And

then we'll send our response back to them and say we would not accept this, and we always follow up and say, please pass our comments onto the developer, we will be prepared to discuss it. And then what tends to happen is that the Developer or Architect or Contractor says well I've done that, if I do that, then we work it out around the table to get it to meet the standards.

What are the *communication* methods or tools used for the compliance of space standards for New Build Homes?

Les: We provide a feedback report on compliance (that's back to the planning people). We provide that in a written document so we have the standard refiled to them which says refractors and we have said that we have checked the planning status such and such thing, window such and such thing, revision such and such number because we have to look into that because what will happen there sometimes is that a Developer or an Architect will send us a set of plans, and asks us to come and turn them and we will say they are great, they are ok, they are bad so we reply back saying that there is no concerns about this particular development and then what happens is that a few months down the line they would be looking down on the side maybe the start of a building putting revisions in and we may not know about them so we have to be careful and say we accepted X drawing when in fact what we built was Y drawing so we are very careful to note that it was version number one or revision number one or something like that. I've had trouble with that in the past where people were saying oh! You've passed it why did you pass it if it's not right and then we get the phones or iPad out and so when we act the plans out, we say I passed that plan, not the one you made a bid for. So, we have to be careful about that. It should be in a form of an email, to the Planning department in a particular format that says these are our concerns or no concerns.

Les: I'm aware that Planning are talking with Building Control on how standards will be complied with. So, if they set a planning standard for a room size, the building inspectors will be going out to make sure that those things are adhered to. And I understand that there are three *levels of compliance*.

What are the *technological* methods or tools used for the compliance of your space standard process and technology integration entail in your organisation?

Les: As you know it's usually a manual process not an automated process. It's manual and it takes time checking of plans, the compliance aspect of it, if those standards are met. I'm talking generally when you bring the building regulation into it especially checking accessibility, security, water, and all of that takes time on paper. That can be very difficult for us to do because timewise, we do lots and lots of other things. Our principal role is actually about being with poor housing conditions, so 20% of what we do is to ensure that plans that are brought to us do meet things. What we tend to do, what happens there is after we have been through the planning process, Ade, they then go into a building regulations process and when they have been through the building regulation stage we then would be able to decide what the fire alarms are the building going to be have, what the windows are going to be like,

what the doors are going to be like, what surface materials are going to be like all those kind of things. What tends to happen after that stage is that we have an automated process when building controls see that we need to involve making sure that housing standards are right, we automatically get a referral from them.

Les: from the planning process. Sometimes there isn't a planning process there's only a building regulation process but what we have we only have it refined when a building comes in that needs our input, the building control, the administration team know that then that must be passed to us. And what happens there is that within that building control process when the work actually starts the building control officers knows us very well and they invite us to go to those visits, and we also do on anything that is a decent-sized projects, you know conversion of a building to a large number of flats, conversions of large HMOs, big buildings, new building that kind of thing. We may be involved at a few stages along the way which may be because of revisions there is refulgent but there is always what they call a compliance visit at the end. So, at the end of the Building Regulations process when everything is done, and it's built, the housing standards is invited along to make sure that what's been built and completed meets the space standard we set out at the beginning and makes sure what we need to do we do.

Les: You asked me about incorporating Level 2 BIM into the planning application procedures. I might ask Michael Molyneux to respond to the questions cos he's the planning policy officer.

Adey: Are you aware of the Level 2 BIM mandate?

Les: No, Michael Molyneux will be in the position to answer that. What I am aware of is that Mike is in touch with Building Control.

What are the prevailing *political* influences surrounding the adoption of your chosen Space Standard for the development of New Build Homes in your locale?

Les: I have read the NDSS when it was originally proposed in 2015, and I was surprised by it and I remembered reading Boris Johnson's comments.

Adey: Boris Johnson was the mayor of London! This is at the national level!

Les: Yeah… Based on London Letting Standard

Adey: Oh, is that a standard?

Les: Yeah, but again that is adopted by local council is not a national legal document. Erm I thought at the time it was highly *aspirational* to go for that space standard. So, a 1-bedroom flat for one person looking at 37m2 with shower room. That's high to be honest with you even in places like Preston where we always require low investment values of goods compared to London where there are sky high buildings, I think that would be a good start. It'll be great to achieve that so going back to your question, I see the planning standard as aspirational and I think it's going the be very difficult for lots people to meet.

Adey: When you say lots of people... which people are you talking about?

Les: For the Developers to meet them. Erm even in the town of Preston I think that is going to be difficult, you know.

What are the prevailing *market* influences surrounding the adoption of your chosen Space Standard for the development of New Build Homes in your locale?

Les: The problem there, Ade, is the time and money, the resources to deal with those things. What I want to do as a controller (an enforcement officer) for these things is to make sure that every person who develops if they are spending a few thousand pounds converting a house or six seven million pounds on converting a property. I want to make sure that what they build it right first time. I hate that when we get a job, and they have to after go over and spend some more money because they missed something or something wasn't set to standard. It does happen again where somebody would do something and doesn't meet our standards and that was why I talked about that compliance visit and that is when we go on and say well, hang on a minute, we told you to put a fire door and you haven't done it and there would be a five to six-hundred-pound worth to re-do that and I hate that (rework cost).

Adey: the main issue is time and money and they don't like to revisit something deemed completed.

Les: Yeah what I would like to say is that in Preston we have a very good relationship with lots and lots of developers, designers and architects and builders as well they know us, and they recognise us they know me in particular well a lot of people because I've been working in Preston all my life and people would say that's them coming from the council.

Adey: they are scared of you?

Les: they aren't scared of us because we work like that all the time. We are an enforcement but at the same time we only enforce if they don't do the things that we want them to do. When we get together at the start of the job, we all agree with each other on what going to be built and we always have a contention at that stage because they want to build quite small, or quite tight and support things and it's my job to say no! Come on this is what you need to do. And always at the back of what I do, Ade, I have an eye on whether it is lettable, rentable what we require from the market whether it is saleable, and I'll say to the developer oh! Come on … We just had a conversion of an office building in Preston, it's on the seventh floor it's quite a big thing and used by a big national insurance company as one of their office bases and the guy wanted to turn it into a flat and he had these terrible designs he had his own very architect and he wasted lots of space in it and I can just look at him and say I could have done a better job and what I actually said to him one day was that we will meet at the front side, get the building opened for me and then we went inside and saw a big roll of masking tape and I told him come on with your architect we will measure it out on the floor what you are proposing to build and we actually take the floor out with the masking tape in the size of flat, in the size of the bathrooms and bedroom, etc and I got into standing saying this what you are proposing to have people living in and the design you are saying would be acceptable to people and he said "it's tiny, I can't touch the wall," and I said "who exactly is going to want to come and live in this place" and I said "they might want to come live in it for a few months

pretty soon they will likely leave the place. So that's a sign for you to think of a stepping stone. After leaving there for few months, people won't look after it, won't have any regard for it, they will damage it. Pretty soon, the investment will go step down step."

Adey: So, all these are problems

Les: Yeah, they are problems if you don't reel it out from the outset. What tends to happen with these is that buildings that are small and very poorly designed eventually they become a place of last resort for people that don't have money very much, nor very good standard of living so they tend to attract people who are currently in the same problem as themselves.

Les: Even in a small city like Preston, because the investment values are low so people need to get their maximum bank portfolio they want to make the maximum profit, the maximum income from the designs that they provide and to provide a one-bedroom flat with that type of amount of space is a high target as far as I'm concerned.

Adey: So, they need more land space?

Les: yeah more land space and design inputs, which brings the cost back again higher because your cost is going higher or is more. Erm! I would look back at it Ade because I'm all about driving standards up and making things better. I will look those figures and ask how did they come about but I think is ambitious. I think it's going to be difficult to implement. Erm I can tell you that a lot of the designs that I see coming through at the moment for a 1b1p flat would be round about 24 - 26m^2 we would accept that.

Adey: the existing ones or the new ones….

Les: Er! new ones, new creation, new conversion.

Adey: So, around 24m^2

Les: 25m^2 yeah, it's a lot lower than that

Adey: maybe 24, 25m^2 they are not self-contained

Les: Yeah, they are self-contained…

Adey: you mean the 24, 25m2 with bath, kitchen, and all that?

Les: what you tend to see is a very small kitchen in every 3m2, so a bathroom with only 2m2, and a shower room and toilet for a small space of 2 1/2m^2. And that then leaves us with 20m2, which will be about 10m2 for the lounge and 10m2 for the bedroom. So, I've just seen a development in Preston that far exceeds those figures

Adey: Students???

Les: Err!! No, not students. The chap who wants to sell those apartments when they are finished is to offer a price guideline in the city centre of about of £350,000 to £400,000 which is very very high for Preston.

Adey: £350 ….?

Les: £350,000

Adey: Oh!!!

Les: Yeah, to sell so he's exceeding those figures but, he's also looking at values, which are much higher in terms it being saleable. So yes, going back to your question; I think that if we can agree on a national standard for homes and increase the sizes towards these figures that would be good. But it needs to be adopted nationally, it needs to be approved by all planning authorities.

What is the *value* derived in terms of benefits or outcomes from compliance of space standards for New Build Homes in your locale?

Les: What we say is that people should not be frightened of us because what we do is to we help them to get it right from the outset. An architect said to me at the end of the day that we finish what we are doing, I actually say to me we saved him a ton of money because what happened is he designed some rubbish corridors. There will always be people who are flying the radar having no regard to me, having no regard for compliance, having no regard for building regulations. And we have a very small proportion of people within the enforcement and we do it very regularly. Erm for most people who recognise that we add value to what they are doing, it's a good relationship you know.

Les: But it actually requires adopting and accepting it in local requirements. Erm! I think if it becomes the nationally accepted guideline Ade, that's very good. What you need to be careful of is that it's enforced and that the requirements are acceptable. Otherwise you're going to get these disparities where people will be developing X city because they know that the space standard, they are on is to be enforced and they are in the right setting.

Adey: So, it's more of a compliance thing, making sure it is enforced?

Les: Yeah, *parity* and *quality*. Manchester competes a lot with Preston, in terms of the universities as regards the standards that they set. We have got to make sure that people who are investing in Manchester are doing so with the same standards in Preston, so that we don't become the place of lesser choice really. It is pretty easier to develop in Manchester than to develop in Preston.

Les: From the Housing Environmental Health perspective, we are sticking to Part 10 of the Housing Act of 1985 to determine what safe requirements are. But that can be a strange thing Ade, you know we talk about safe and healthy place to live; imagine if you design a house for me, a one-bedroom house. But the bedroom is, say, 25m^2 size and it has a ceiling height of say 10foot or 3.5m high. Is that a safe and healthy place to live in because you've got this huge bedroom with a high ceiling? To my mind that's not a safe and healthy place to do either because that person must heat that bedroom in a particular way and lots of energy put to that place. A high ceiling with lots of windows; it's a beautiful room but can that person safely and healthily live in that room – it's not always the case. Especially, if that room is designed for the low-end of the market, low-investment end of the market, it could be quite difficult to implement it. In other words, I take the low rental value property and I give somebody that

size of room, I am not expecting that there won't be any difficulty in paying for the bills, that kind of thing.

Les: Let's say I give him electric heating to heat away that size of room with big windows…So the whole thing about Space Standards is not we don't like small rooms, instead we ask is it a safe place to live in.

APPENDIX 7: INVITATION TO PARTICIPATE IN QUESTIONNAIRE SURVEY

RESEARCH TITLE: Key Compliance Mechanisms of Spatial Requirements for New Build Homes in England

Dear Respondent,

My name is Adedotun Ojo, a research student in the Department of Construction & Civil Engineering, School of Engineering, University of Central Lancashire, under the joint supervision of Dr. Stanley Njuangang and Dr. Godfaurd John.

You are kindly invited to participate in this questionnaire study for the research title shown above. Space is one of the most important elements of building design to define the users' requirements and functions of a building. The Housing Standards Review that was concluded in 2016, was designed to streamline and simplify the planning process for creating quality (in terms of space performance) and sustainable housing in the UK. Unfortunately, however, it appears to have caused a lot of confusion and a low rate of compliance to housing space standards for new build homes in England.

As part of the requirements for the fulfilment of my research objectives, this research will aim to evaluate the key compliance mechanisms or factors influencing the adoption and compliance of housing space standards by local planning authorities, housing developers, and housing associations/landlords across England.

I would therefore be grateful if you would spare 20 minutes of your valuable time to complete the survey, which is up until the 30th April 2018. This research has been approved by the University Research Ethics Committee; hence your utmost confidentiality, privacy and anonymity will be ensured in the collection, storage and publication of research material in accordance with the University's policy on Academic Integrity.

Thank you very much for your audience and cooperation.

Yours faithfully,

Adedotun Ojo,
Research Student,
Construction & Civil Engineering Department,
School of Engineering,
University of Central Lancashire,
Preston, PR1 2HE
T: 01772894214
E: adedotun.ojo@outlook.com

PREAMBLE:

Definition of Compliance for this study: Compliance is defined as the organisational policy, framework, model, processes, and systems used to ensure adherence with housing space standards for new build homes in England.

SECTION 1: General Information

1. What is your current job title? ……..

2. Which city and region of England are you based? ……

3. How would you describe the sector of the new build housing industry your organisation is involved in?

[ ] Local Planning Authority
[ ] Private House builder/Developer
[ ] Registered Landlords
[ ] Housing Associations
[ ] Owner-occupier provider
[ ] Private Renting Providers
[ ] Social Renting Providers
[ ] Other

4. How many years of experience do you have in new build housing industry?

[ ] 0 – 5 years
[ ] 6 – 10 years
[ ] 11 – 15 years
[ ] 16 – 20 years
[ ] Over 20 years

5. How many employees are there in your organisation?

[ ] 1 – 50
[ ] 51 – 100
[ ] 101 – 200
[ ] 201 – 500
[ ] Over 500

SECTION 2: Compliance Characteristics of the Organisation

6. What is the compliance and adoption rate of housing space standards in your organisation for new build housing developments?

[ ] Very Low
[ ] Low
[ ] Average
[ ] High
[ ] Very high

7. Does your organisation currently adopt the Nationally Described Space Standards (NDSS) for the development of New Build Homes?

[ ] Yes
[ ] No plans to adopt
[ ] Plans to adopt in the future

SECTION 3: Compliance Mechanisms for the Adoption of Housing Space Standards

8. Indicate the level of importance of the following factors in the adoption and compliance of housing space standards for new build housing developments? Please, rate by ticking the following below:

1 = Not important | 2 = Somewhat important | 3 = Important | 4 = Very important

Strategic Objectives	**1**	**2**	**3**	**4**
Policy frameworks or space standards that are tailored for the development of new build homes only				
Formulate regulations that define the spatial and activity-based needs of new build housing developments				
Strategic planning of new homes using criteria like demography, housing typologies, specifications, projections of people likely to occupy new homes				
Development of guidance and best-practice examples on housing design, site layout, housing density, typology, room size, etc				
Provision of advice about various housing options to prospective new build home buyers				
Identification of the amount of space required to allow rooms and houses to meet their functional purposes				
Creation of enabling and sustainable local communities				
Focus on the identification of generally accepted requirements to improve the existing space standards				
Deliberation on the accessibility and convenience of a new home for later life				
Any other (Specify & rate) ……				
Responsibilities, Skills & Expertise	**1**	**2**	**3**	**4**
The setting up of a compliance committee to oversee all stages of development whether big or small				
Review of housing conditions pertaining to a proposed development				
Local Planning Authority taking responsibility for regulating the development of new build homes				
Application of the National Planning Policy Framework (NPPF) document in the preparation of local plans for local communities				
House builder the responsibility to make decisions on design criteria, usability factors, and the role of developing new build homes				
Any other (Specify & rate) ……				
Effective Collaboration & Stakeholder Adoption	**1**	**2**	**3**	**4**

A platform that allows for openness, transparency, and fairness in the adoption of space standards				
Early engagement of all the stakeholders at the pre-application stage to enhance the effectiveness and efficiency of the planning application system				
Due consultation with the local community in the development of the local plan and use of space standard				
Establish a feedback mechanism to enhance the compliance reporting process				
Any other (Specify & rate) ……..				
Compliance Process & Technology Integration	**1**	**2**	**3**	**4**
Application of new technologies to enhance the adoption of space standards for new build development				
Effective site planning and construction techniques that enhances design criteria and quality				
A series of compliance visits by the building control and planning departments to ensure adherence to the required space standards				
Any other (Specify & rate) ……				
Political Influence	**1**	**2**	**3**	**4**
Necessity of political support to drive the supply of housing quality in terms of space performance				
Heavy restriction of the government on the supply of land that is sufficient for housing development and compliance to space standards				
Government hesitancy to directly enforce space standards				
Role of government incentives on the adoption rate of space standards and housing performance				
Permission to the local planning authorities to adopt the Nationally Described Space Standard or any other housing space standard				
Any other (Specify & rate) ……				
Market Influence	**1**	**2**	**3**	**4**
The influence of the public to drive the compliance of the housing developers to adopt the housing space standard				
Consensus amongst all the stakeholders (regulatory bodies, developers, clients, etc.) on the level of planning enforcement and adoption of housing space standard				
The interference of regulatory decision with housing developments that is driven by the private sector market				
The marketing of new house sizes by the number of bedrooms, and not by space floor space area				
Development of a wide range of high-quality space compliant homes promotes the housing market				
Development of a variety of housing typologies (i.e. bungalow, medium-rise, high-rise buildings) that are space compliant, gives customers varied housing alternatives				

Development of a wide range of spatially compliant homes promotes profit for developers and housing providers				
The reproducibility of housing typologies (i.e. bungalow, medium-rise, high-rise buildings) across the country increases the adoption of the required space standards				
Any other (Specify & rate) ……				
Compliance Outcomes	**1**	**2**	**3**	**4**
Adoption of space standards improves the quality of life of the residents, in terms of space, accessibility, flexibility, and adaptability, for a lifetime use				
Adoption of a common set of space standards across England leads to equal investment, opportunities, and development				
Space standards have to be supported with other housing standards and building regulations to result in full benefits to the relevant stakeholders				
Space standards have to be supported by a viable form of procurement and long-term management plans				
Development of a value-driven methodology crucial for evaluating housing quality				
Any other (Specify & rate) ……				

Please, identify any other compliance mechanisms or issues surrounding new build housing development not covered above.

i.
ii.
iii.

MANY THANKS FOR YOUR TIME!

APPENDIX 8: SAMPLE RESPONSE FROM QUESTIONNAIRE SURVEY

Jisc bos

Housing Space Standards Survey (copy2)

Response ID	Completion date	
355539-355530-34815166	4 May 2018, 13:17 (BST)	

SECTION 1: General Information

1	What is your current job title?	Planning Policy Officer
2	Which city and region of England are you based?	Greater London
3	How would you describe the sector of the new build housing industry your organisation is involved in?	Local Planning Authority
3.a	If you selected Other, please specify:	
4	How many years of experience do you have in new build housing industry?	Over 20 years
5	How many employees are there in your organisation?	201 - 500

SECTION 2: Compliance Characteristics of the Organisation

6	What is the compliance and adoption rate of housing space standards in your organisation for new build housing developments?	High
7	Does your organisation currently adopt the Nationally Described Space Standards (NDSS) for the development of New Build Homes?	Yes

SECTION 3: Compliance Mechanisms for the Adoption of Housing Space Standards

8	Strategic Objectives: Indicate the level of importance of the following factors in the adoption and compliance of housing space standards for new build housing developments? Please, rate by ticking the following below

1 / 4

8.1	1. Policy frameworks or space standards that are tailored for the development of new build homes only	3 = Important
8.2	2. Formulate regulations that define the spatial and activity-based needs of new build housing developments	4 = Very important
8.3	3. Strategic planning of new homes using criteria like demography, housing typologies, specifications, projections of people likely to occupy new homes	3 = Important
8.4	4. Development of guidance and best-practice examples on housing design, site layout, housing density, typology, room size, etc	2 = Somewhat important
8.5	5. Provision of advice about various housing options to prospective new build home buyers	4 = Very important
8.6	6. Identification of the amount of space required to allow rooms and houses to meet their functional purposes	4 = Very important
8.7	7. Creation of enabling and sustainable local communities	4 = Very important
8.8	8. Focus on the identification of generally accepted requirements to improve the existing space standards	4 = Very important
8.9	9. Deliberation on the accessibility and convenience of a new home for later life	4 = Very important
8.a	Any other factor (Please specify)	

9	Responsibilities, Skills & Expertise: Indicate the level of importance of the following factors in the adoption and compliance of housing space standards for new build housing developments? Please, rate by ticking the following below	
9.1	10. The setting up of a compliance committee to oversee all stages of development whether big or small	4 = Very important
9.2	11. Review of housing conditions pertaining to a proposed development	3 = Important
9.3	12. Local Planning Authority taking responsibility for regulating the development of new build homes	4 = Very important
9.4	13. Application of the National Planning Policy Framework (NPPF) document in the preparation of local plans for local communities	4 = Very important
9.5	14. House builder the responsibility to make decisions on design criteria, usability factors, and the role of developing new build homes	3 = Important
9.a	Any other factor (Please specify)	

10	Effective Collaboration & Stakeholder Adoption: Indicate the level of importance of the following factors in the adoption and compliance of housing space standards for new build housing developments? Please, rate by ticking the following below	
10.1	15. A platform that allows for openness, transparency, and fairness in the adoption of space standards	4 = Very important

10.2	16. Early engagement of all the stakeholders at the pre-application stage to enhance the effectiveness and efficiency of the planning application system	3 = Important
10.3	17. Due consultation with the local community in the development of the local plan and use of space standard	4 = Very important
10.4	18. Establish a feedback mechanism to enhance the compliance reporting process	4 = Very important
10.a	Any other factor (Please specify)	

11	Compliance Process & Technology Integration: Indicate the level of importance of the following factors in the adoption and compliance of housing space standards for new build housing developments? Please, rate by ticking the following below	
11.1	19. Application of new technologies to enhance the adoption of space standards for new build development	1 = Not important
11.2	20. Effective site planning and construction techniques that enhances design criteria and quality	2 = Somewhat important
11.3	21. A series of compliance visits by the building control and planning departments to ensure adherence to the required space standards	4 = Very important
11.a	Any other factor (Please specify)	

12	Political Influence: Indicate the level of importance of the following factors in the adoption and compliance of housing space standards for new build housing developments? Please, rate by ticking the following below	
12.1	22. Necessity of political support to drive the supply of housing quality in terms of space performance	4 = Very important
12.2	23. Heavy restriction of the government on the supply of land that is sufficient for housing development and compliance to space standards	1 = Not important
12.3	24. Government hesitancy to directly enforce space standards	1 = Not important
12.4	25. Role of government incentives on the adoption rate of space standards and housing performance	4 = Very important
12.5	26. Permission to the local planning authorities to adopt the Nationally Described Space Standard or any other housing space standard	4 = Very important
12.a	Any other factor (Please specify)	

13	Market Influence: Indicate the level of importance of the following factors in the adoption and compliance of housing space standards for new build housing developments? Please, rate by ticking the following below	
13.1	27. The influence of the public to drive the compliance of the housing developers to adopt the housing space standard	3 = Important
13.2	28. Consensus amongst all the stakeholders (regulatory bodies, developers, clients, etc.) on the level of planning enforcement and adoption of housing space standard	4 = Very important

13.3	29. The interference of regulatory decision with housing developments that is driven by the private sector market	1 = Not important
13.4	30. The marketing of new house sizes by the number of bedrooms, and not by space floor space area	1 = Not important
13.5	31. Development of a wide range of high-quality space compliant homes promotes the housing market	4 = Very important
13.6	32. Development of a variety of housing typologies (i.e. bungalow, medium-rise, high-rise buildings) that are space compliant, gives customers varied housing alternatives	4 = Very important
13.7	33. Development of a wide range of spatially compliant homes promotes profit for developers and housing providers	4 = Very important
13.8	34. The reproducibility of housing typologies (i.e. bungalow, medium-rise, high-rise buildings) across the country increases the adoption of the required space standards	3 = Important
13.a	Any other factor (Please specify)	

14	Compliance Outcomes: Indicate the level of importance of the following factors in the adoption and compliance of housing space standards for new build housing developments? Please, rate by ticking the following below	
14.1	35. Adoption of space standards improves the quality of life of the residents, in terms of space, accessibility, flexibility, and adaptability, for a lifetime use	4 = Very important
14.2	36. Adoption of a common set of space standards across England leads to equal investment, opportunities, and development	3 = Important
14.3	37. Space standards have to be supported with other housing standards and building regulations to result in full benefits to the relevant stakeholders	4 = Very important
14.4	38. Space standards have to be supported by a viable form of procurement and long-term management plans	2 = Somewhat important
14.5	39. Development of a value-driven methodology crucial for evaluating housing quality	2 = Somewhat important
14.a	Any other factor (Please specify)	

15	Please, identify any other compliance mechanisms or factors surrounding new build housing development not covered above.	

16	Username	

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