Leveraging Customer Satisfaction Using BIM: House Builders' Perspective

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Abstract

The UK housing industry is growing from the recent recovery of global and the UK economy. More homes are currently required to be built putting a strain on resources. Over the last fourteen years customer satisfaction has been a key performance indicator for the UK government and industry bodies to determine the quality and service that is being provided by house builders. As a result, house builders and professional bodies over these years have strived to improve the level of after sales customer satisfaction. This has led to increased customer satisfaction during the recession. However recent drive for increased productivity levels have reduced customer satisfaction levels; suggesting that the industry needs to use innovation to provide higher levels of customer satisfaction while maintaining productivity. BIM is a new way of working that enables digital representations of the physical and functional characteristics of a facility. BIM intends to supply usable information throughout the lifecycle of a project. The housing industry is beginning to utilise BIM in certain aspects within the business. The implementation of BIM into customer care departments could be the innovation the industry so desperately needs to enhance customer satisfaction. This paper explores how after sale customer satisfaction is evaluated by the UK house builders and their opinion on how BIM can be used to enhance customer satisfaction.

Keywords: BIM, Customer Satisfaction, After Sale Customer Care, Volume House Builders, Housing Industry

1. Introduction

In 2004, the Barker review was published with a view of globally examining the current Housing Industry. Areas such as economic stability and growth, to environmental considerations were reviewed and the report identified thirty five recommendations in order to develop the current housing industry with the aim of improving customer confidence which was the mechanism to drive house builders to improve customer satisfaction. Further proposal by Callcutt review team (2007) recommends that house builders must achieve customer satisfaction standards within the next two years. However, the Office of Fair Trading (OFT) (2008) points out that even within this broadly competitive sector, many homebuyers experience faults or delays, which includes but not limited to postponements to initial moving in date and faults in new homes. On 1st of April 2010, Consumer Code for Home Builders was made mandatory in the UK and was implemented by the industry's main warranty providers – National House Building Council (NHBC), Premier Guarantee and Local Authority Building Control (LABC). Any house builders using the aforementioned institutions are now required to implement the Consumer Code into their business approach. The code provides guidance to house builders and entails requirements for suitable systems and procedures to ensure it can reliably and accurately meet the commitments on service, procedures and information (Consumer Code for Home Builders, 2010).

From 2006 onwards, there have been extensive market studies that illustrate continuous improvement by house builders relating to customer satisfaction. In a market survey carried out by OFT between 2006 and 2008, an average of 75% of the customer recommended their builder to other potential buyers (OFT, 2008). In March 2015, National Builders Federation (NBF) published further findings based on the 'National New Home Customer Satisfaction Survey'. In comparison, between 2011 and 2012 a 91% of the customers recommended their builder. This suggests that housing developers are striving to improve customer's satisfaction throughout the process. Transparency to the customer through communication and involvement during the construction is now an integral part of the majority of house builders. As such several house builders are starting to offer fundamental customer communication tools to provide them with information on their acquisition from inception to final completion. Conversely many purchasers can still find the process both ambiguous and confusing.

Building Information Modelling (BIM) and related technologies provide an opportunity to improve communication between builder and customers and therefore reduce customer complaints and improve customer confidence. However, many working within house-building do not yet have an awareness of its potential benefits of BIM (NBS, 2013). In order for BIM implementation to be a viable option, house builders must increase their own knowledge and understanding of BIM throughout their business with a view to successfully improve the limited awareness of the potential customers. Therefore a sustainable BIM platform with a user friendly interface for the customer to access during the construction, handover and operation is essential to develop confidence and heighten customer satisfaction. This paper explores how after sale customer services are provided by house builders and the use of Building Information Modelling (BIM) to enhance customer satisfaction.

2. Literature review

In 2014 the Lyons housing review was published by the UK Housing Commission. The basis of the report is to determine how best to increase new build units entering the market. Lyons (2014) suggests building at least 243,000 homes a year to keep up with an ever increasing demand from the growing population (see Figure 1). Statistics published by the DCLG indicate that the building industry from 2012-2013 produced 118,540 new builds, which is less than half the recommended units detailed in Lyon's report. Currently the housing market would seem to be on the mend from an incredibly difficult period of its long history. Annual housing starts totalled 137,780 in the 12 months to June 2014, an increase of 22% compared to the year before (Sleight, 2014). Currently developers producing between 500 and 2000+ units yearly contribute to the majority of the overall new build completions yearly figures (Lyons, 2014).
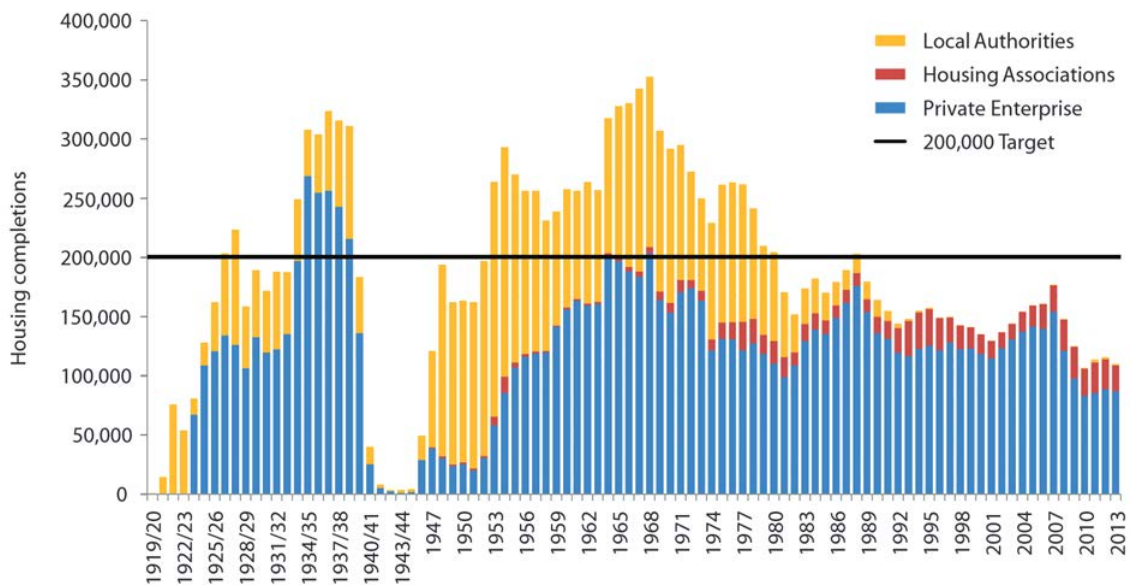

Figure 1: Historic housing completions in the UK (Lyons, 2014)

2.1 Customer Satisfaction in Housing

The Latham report recognised the customer as being at the core of the construction process (Latham, 1994). Hayes (2008) suggest that customer satisfaction and perception of quality are labels used to summarise a set of observable actions related to the product or service. A further definition of satisfaction presented by Kotler and Keller (2006) outlining satisfaction as *"person's feeling of pleasure or disappointment which resulted from comparing a product's perceived performance or outcome against his/ her expectations"*. Rai (2008) and Churcher (2003) draws the basic formula of customer satisfaction as: *"Customer satisfaction = Customer Perception of the Service Received – Customer Expectation of Customer Service"*. A house is one of the biggest purchases many people will make in their lifetime. Ozaki (2010) argues that *"house builders have increasingly been searching for ways to be more customer focused"* and thus the level of expectation when buying a home and the advertised level of service a house builder provides will elevate the customers' expectations even higher. Whilst Oliver (1993)

considers customer satisfaction in housing as being a comparison between the customer's pre-purchase expectations and their after purchase perceptions.

The national housing output requirements show that housebuilders need to build more houses every year. The volume of new build unit requirements to meet public demand by house builders will need to rise by half their current output. Therefore challenges set upon the house builders business to achieve these targets such as resource restrictions, availability of material, lack of suitable labour, increasing land values and increase in the requirement to build on brown field developments. This increase in output, could have a potential effect on the customer experience and overall satisfaction of the product. Customer satisfaction of an end product is seen as a direct and reliable indicator of a business' future performance. Cronin and Taylor (1992) suggest customer satisfaction to be important means of obtaining competitive advantage in the market place. Therefore is important for of housebuilders' business growth to improve and maintain customer satisfaction.

Since 2006, Home Builders Federation (HBF) has measured customer satisfaction in the UK which records results from new home customer satisfaction surveys. The surveys were implemented in response to recommendation 32 of the Barker review of housing supply (2004) which stated that the house building industry must demonstrate increased levels of customer satisfaction. In response to the new homes customer satisfaction survey volume house builders have now dedicated customer care teams across their business offices each providing a direct link of information to the customer and responding to all customer complaints to ensure a positive outcome.

To improve customer satisfaction, house builders need to innovate and develop systems to streamline and energise the after sales experience both for the customer and the internal customer care team and therefore to improve follow-ups on incomplete items. According to CA Design services (2001) *"customer satisfaction comes from exceeding expectations, that means not just meeting the basic need for a building, but also providing services that meet and exceed their specific individual requirements, as a result delivering something extra"*. There are anecdotal evidence that suggests BIM as an approach to improving customer satisfaction. For this the industry needs a systemic change rather than a visualisation tool. Hence, it is important to understand what BIM and its potential use.

2.2 What is BIM?

Building Information Modelling, BIM is set to modernise the construction industry. According to Gardiner (2013) BIM is a way of working that allows virtual 3D models of buildings to be created by designers and contractors that can be shared with an entire project team. Information about objects and products that goes into constructing and maintaining a building can also be added to the model. NHBC (2013) suggests that *"BIM is a process that improves the efficiency of organising and distributing information - or data - that is generated during the design and construction of buildings and infrastructure"*.

RIBA proclaims BIM to be the, *"the process of generating and managing data about the building during its lifecycle"*. (RIBA insight, 2014). Which suggests BIM offers increased productivity in design and construction from the data in produces and holds. It delivers value through creation, collation and exchange of shared models and corresponding intelligent structured data. BIM can assist to close the gap between stages with shared data sets while allowing transparency. From these BIM can be understood as a different way of thinking and working by sharing, and effectively working on, a common information pool. BIM involves building a digital prototype of the model and simulating it in a digital world. This suggest that BIM must be promoted as a delivery system to produce an intelligent model that can hold physical attributes that could be used for overall design decision making.
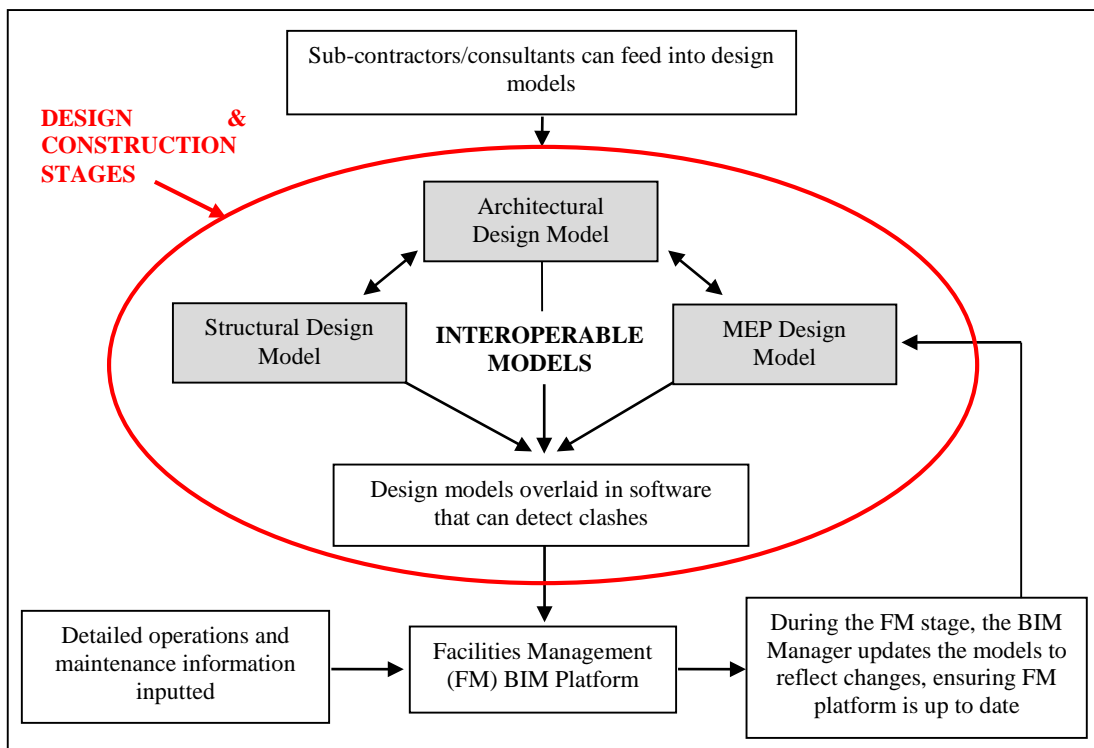

Figure 2: Interoperable BIM Process

The introduction of BIM has been brought about due to a requirement for increased sustainability and productivity within the construction industry (BIS, 2011). As stated by BIS (2011) there are four levels of BIM adoption, from 0-3, depending on how models are managed and the collaborative working practices are adopted. Level 2 essentially requires teams to be working collaboratively with 3D BIM (see Figure 2), however with no obligation for the 4D programme, 5D cost and operation elements to be incorporated within the model (Isikdag, Underwood, & Kuruoglu, 2012).

2.3 House Builder's and BIM

As suggested by Saxon (2013) *"The arrival of BIM since the early 2000s has been USA- led"*. A study by National Building Specification (NBS), has made yearly information available since 2011. The reports suggest improvement in awareness and use of BIM across the industry.

However, a recent report by the NHBC indicates that the majority of the major house builders in the UK are currently not engaged in BIM (NHBC, 2013) (see figure 3). This would suggest that due to the amount of awareness in the industry, it does not seem to potentially be in House Builders' vision for the foreseeable future.

Furthermore, the benefits that BIM can provide to house builders are not adequately researched. There are challenges that come hand in hand with the implementation of BIM as an integral part of a business including technological and business process integration, as with any enhancement. The effect of making a momentous step when resources are at their most stretched as demand is out weighing supply both from a materials and customers point of view.
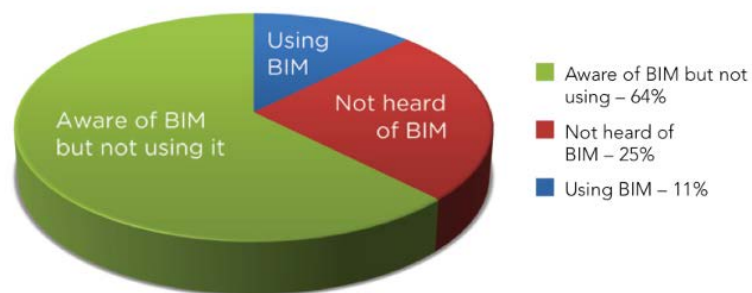
Figure 3: House builders' engagement with BIM (NHBC, 2013)

Organisations are cautiously starting to move forward and upscale operations from the recent recession. BIM is seen as similar to move to drafting on tracing paper to using 2D. As proclaimed by CA Design services (2011), "BIM by its nature is client-centric" and can, used well, deliver better services. Including:

- Provide accurate documents.
- Improve communication between the customer and the house builder.
- Reduce errors and coordination issues leading to cost saving to the house builder.
- Inform clients with visual aids and represent the final product to avoid any unwanted features.
- Produce a product that is less defective and thus increases the satisfaction of the customer.

Over the last 15 years customer satisfaction has been a major factor for a house builder and has been increasing year on year. However the house builder approaches a potential tipping point and will require systems of innovation in place that can manage to ease pressure on personnel and resources to allow them to get on with building houses to a high standard.

BIM could be that revolutionary system by:

- Providing real time information to customer on build completion date.

- Storing of information in one place including house designs from wall construction to boiler type to tile manufacturer. Information includes contracts, Warranties and itemise details of what parts of house is under warranty and terms, from reservation to after sales care.
- Storing relevant underlying data (e.g., material, dimension, cost, energy performance, and even product availability) that allow builders, designers, and buyers to make informed decisions (See figure 2).
- Allowing access to site production team and update model house types where clashes have occurred in design.
- Allowing customers to pinpoint defects to ensure the right after sale support and relevant trade visits to complete the work.
- Providing the customer the option to improve design and / or functionality that can be passed to architect for review of current customer living needs and requirements.

Briefing documents	Costing/supplier enquiries
General correspondence	Quotations
Feasibility studies	Requests For Information (RFIs)
Utilities and infrastructure reports	Tender/contract documents
Site surveys	Commissioning sheets
Ecology studies	Working drawings
Design drawings	O&M manuals
Specifications	Statutory certificates
Schedules	Local authority submissions and approvals
Programmes	Financial management

Figure 4: Information types for house builders (NHBC, 2013)

These points are by no means exhaustive; for implementation a clear delineation is essential to appreciate what is needed and to consequently support a strategy for operation. BIM entails an adjustment to a collaborative and autonomous way of managerial philosophy to essentially enrich the corporate benefits previously detailed. Suggesting BIM is more than just an enhancement of an existing software package but more of a sophisticated computer software creating a virtual model that can benefit all professionals in the lifecycle process. With BIM customer care departments can potentially lead to increased customer satisfaction and transparency.

3. Research methodology

Research methodology refers to the overall approach to the design process from the theoretical underpinnings to the collection and analysis of the data (Collins and Hussey, 2003). For this research, fourteen semi structured interviews were conducted with customer care professionals working in Volume House Builder organisations to gather qualitative data. Interview questions were divided into two sections, a) to understand the current process of after sales customer care b) potential influence of BIM on customer satisfaction. Initial pilot studies prompted further research into a software package that was used by many respondents. It was identified that the

current after sales system providers were developing BIM for integration into their current software. During the interviews open questions were used. These open questions allowed the development of an open forum, in order to capture the opinion of the interviewees and to develop a meaningful understanding of how current systems work within the organisation and as discussed above, how BIM would be an added benefit rather than a system overhaul.

4. Findings and Discussion

Customer care ratings produced by the NHBC/HBF are very significant to how potential customers perceive them and how well developments sell. Most of the interviewees indicated that house builders currently have business objectives in place to improve after sales customer satisfaction. Plumbing, drainage, electrical issues and painting were suggested as the main complaints/issues received after sale. Most of the interviewees confirmed that a similar system is currently used within the customer care department. Interviewee 1 stated that the current *'system is very good and is used universally by all of our regions'*. This links all departments under one umbrella from land acquisition, feasibility studies, design, procurement, build programme, payments, sales, and customer service and after care. *'It's a company package that we bolt on to and not just specific to our department'* as interviewee 3 proclaimed.

This customer care system starts when a customer advisor receives a call/text/email from the customer. Then the customer care advisor contacts the customer and discusses the issue. From the information provided, the advisor can find the property address and identify a contractor to complete that work. A defect report is then sent to the contractor and the system keeps a log of initial customer contact. The contractor is normally given three days to contact the customer and arrange an appointment with the customer to complete the work. The contractor then updates the advisor who then contacts the customer to ensure that they are satisfied with the ongoing process.

All interviewees discussed the complex communication lines between four or more parties when dealing with issues. It was a common theme from the interviews that communications become very diverse as all parties can talk to each other at different times, agreeing different arrangements. All interviewees confirmed that arrangements between two parties are very rarely communicated effectively to all other parties. This leads to a very complicated and chaotic approach, and parties can be left unsure of what is required of them and when. This needs a better communication system incorporated into the customer care process. Interviews also advocated for increased support from subcontractors and a better user friendly system to improve after sale services.

The interviewees recognised the use of BIM to avoid errors in communication and help support the customer care department in trying to bring everyone together. House builders are starting to develop large 1000 unit parcels of land. To speed up the development of these parcels and to spread risk, multiple developers work together as a consortium. With this in mind, house builders need to implement a system that not only allows communication between participants during the construction stage but also for after sales operations. This means house builders need

a systemic change to their operations. BIM can improve communication between the clients and house builders and can reduce number of snags (defects). BIM models hold information such as who installed the building element, supplier details, warranties, insurances and all building components operating user manuals about a specific property. Interviewees suggested that the system with the 3D user interface could provide diagnostic tools to enable users to resolve the issues themselves with step by step guides. These models could provide a maintenance plan for the owner providing updates on when maintenance is required such as boiler check and electric test. This would enable more efficient fault detection and reduce customer complains. Most of the interviewees suggested that BIM could help to decrease delivery time as they can communicate with customers, contractors and suppliers more efficiently. BIM makes it possible to integrate information from different disciplines in different phases of the building process enabling a central location for communication links between all departments within the business as well as the customer. Current systems and processes are not equipped to deal with the increased requirements of the industry. BIM could be utilised to drive and improve customer satisfaction across the business. A strong company brand with efficient processes through the business can lead to increased employee satisfaction while being able to attract the best talent in the market further increasing the quality and satisfaction the customer receive.

The significant barrier is the implementation of BIM into current house builder software infrastructure. As the majority of volume house builders use a similar system it would be difficult to change and introduce a new one. Findings suggests that BIM is being designed into the current system and therefore would not be an onerous or difficult process to integrate. This would be beneficial to the customer care department as the current system is not designed specifically for efficient work processes.

5. Conclusion

The research has attempted to establish an understanding of what customer satisfaction means to a house builder and the current systems they have in place to be able to satisfy their customers. House builders are pushed to produce more houses across the nation. However this could affect customer satisfaction levels in the industry. There is significant need for innovation and improved systems to centralise asset data and provide customers with services that exceeds their expectations to improve and maintain customer satisfaction. BIM could be the innovative tool providing real-time information to the clients and to streamline aftersales operations.

Findings suggest that housebuilders are reluctant to change their current aftersales systems. However there is an overwhelming suggestion to integrate BIM as part of the current aftersales system, especially with the provision of online 3D model based graphical user interface to improve communication. This means house builders need to integrate BIM across the organisation and ensure the use of BIM throughout the lifecycle of a building. However, further research is required in understanding how the existing system and BIM can be effectively integrated throughout the lifecycle of a building to improve customer satisfaction.

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