

Bim will help aid the quantity surveyor construction essay



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Dissertation Module code: 6CN010 Department: School of Technology Student

no: 1023268 Supervisor: John Reynolds Date: 20th April 2013 Words: 6, 180

words so far" Presented in partial fulfilment of the assessment requirements for the above award".

DECLARATION

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ACKNOWLEDGEMENTS

I would like to express my gratitude to my Dissertation supervisor, John Reynolds, who has taken out his precious time in providing his assistance throughout my dissertation work, his knowledge and understanding over the subject has helped me to learn crucial aspects that were required for undertaking my dissertation. Finally, I must also express my gratitude to my family and friends whose help and care was always there in any respect with regards to the completion of my dissertation. Signature

.....Date

ABSTRACT

" Building Information Modelling (BIM) is a revolutionary technology and process that has transformed the way buildings are designed, analysed, constructed, and managed" (Hardin, 2009, p. 2). BIM has taken the

construction industry into a new-era where all processes has fasten up, the benefits are not just time and cost savings but also reduction of risks and uncertain in construction process. From the through literature review of many researchers works published in various journals suggestions are being made as how this BIM approach is being carried out in construction industry, at the same time a critical literature review is also being conducted on the cost estimation within BIM technologies and whether this can benefit or harm the future role of the quantity surveyor. A questionnaire was designed to identify how the use of BIM will affect the future role quantity surveyor. The questionnaires were distributed to family and friends working within the construction industry and also construction professionals within the UK. From analysis the results obtained and comparing them with the literature review. Implementing BIM within the construction industry although the Government Chief Construction Adviser Paul Morrell called for BIM adoption on UK government construction projects of £5 million and over. And also in June 2011 the UK government published its BIM strategy, announcing its intention to require collaborative 3D BIM (with all project and asset information, documentation and data being electronic) on its projects by 2016 (Elena Poletayeva, 2011). At this current time there is a clear indication that BIM isn't being used to its full advantage within the construction industry

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CHAPTER 1: INTRODUCTION TO DISSERTATION

The following research will investigate and analysis how the use of BIM will affect the future role of the quantity surveyor. According to the Royal Institute of British Architects RIBA (2012), almost a third of construction consultants are now using BIM. Thenbs (2011) provided information that in May 2011 UK Government Chief Construction Adviser Paul Morrell called for BIM adoption on UK government construction projects of £5million and over. Thenbs (2012) stated that Building Information Modelling covers geometry, spatial relationships, light analysis, geographic information, quantities and properties of building components. BIM data can be used to illustrate the entire building life cycle. Quantities and properties of materials can be extracted easily and the scope of works can be easily defined. Furthermore systems, assemblies and sequences can be shown in a relative scale to each other and relative to the entire project.

1. 1 PROBLEM IDENTIFICATION AND PURPOSE OF STUDY

The purpose of this research report is to investigate the qualities of BIM and the influence it will have on the quantity surveying profession, through research of the opportunities and barriers that it brings forth, and the changes to be made and measures to be taken by quantity surveyors in the future, in order to successfully incorporate BIM into the quantity surveying

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profession." The main role of Quantity Surveyors is to estimate the building cost, the modern quantity surveyor provides a service that covers all aspects of procurement, contractual and project cost management. The role of the quantity surveyor plays a very important role in all phases of any type of Construction Company" (surveyors, 2013). The modern quantity surveyor plays a central role in the management of construction projects (Towey, 2012 p. 26)." estimators have developed their computing skills in using estimating systems but mostly relying in adopting spread sheets and database ages"(Brook, 2008 p. 9). Repository (2012) stated that over the years the need for more cost effective, better quality and environmentally friendlier construction has grown, these factors are the main Influences on the development of technology in the construction industry. Building Information Modelling (BIM) is one of the technologies that have been creating a buzz in the construction industry over the last few years.

Ukconstructionessays (2012) provided information that Building Information Modelling, or better known as BIM is not; strictly speaking a new technology as it has been developing and used by other industry sectors since 1950s i. e. the automotive and aero plane industries. As technology evolves, we are forced to evolve with it or run the risk of being left behind. The traditional way of utilising the services of a quantity surveyor has largely been at the stage of costing a design, and the production of procurement and construction documentation (Asworth and Hogg, 2002p. 67). With the development of technology like BIM, the responsibilities of professionals are starting to shift. BIM includes a series of cost management functions that could change the processes of cost management of construction projects.

This forces the quantity surveyor to focus more on different parts of the cost
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management process, than what would have previously. Not only will BIM influence the cost management functions and responsibilities of the quantity surveyor, but also the technology and types of software that are currently used in quantity surveying offices. The responsibilities of quantity surveyors will be changed as some of their traditional roles will be replaced by the use of, so that their focus will shift from bill producers to cost managers, which will shift the design process from costing to a design to designing to a cost.

1. 2 STRUCTURE OF THE DISSERTATION

The whole dissertation is primarily divided up into 6 chapters. Chapter 1 -

IntroductionThe introduction provides a general outline of the dissertation including the research rationale, aim and objectives, chosen methodology, research limitations and the beneficiaries of the dissertation research.

Chapter 2 - Literature ReviewThe literature review chapter aims to provide the theoretical and academic background on the subject of construction delays. Specifically, the literature review primarily targets to define delay in construction before establishing the causes, types and impacts of delays in

the construction industry. Chapter 3 - Research MethodologyChapter 3 identifies and justifies the type of methodology chosen to undertake the dissertation research and data collection and in particular how the methodology enabled the dissertation aim and objectives to be achieved.

Furthermore Chapter 3 explains the ideology behind the interview process and considers pilot studies and sampling procedures. The chapter also highlights and vindicates the techniques and actions that were used to analyse the dissertation data, before examining the ethical considerations of the dissertation. Finally the chapter exemplifies the limitations of the

methodology and how they have been overcome. Chapter 4 - Analysis & Discussion Chapter 4 provides the reader with a background history of the case study and considers all of the integral elements in relation to the dissertation investigation. Quintessentially the chapter discusses why this particular case study was chosen and aims to enable the reader to picture and appreciate the case study development in more detail. Chapter 5 - Conclusions & Recommendations Chapter 5 mainly comprises the analysis of the dissertation data collection and signifies the findings from the interviews and documentation. Furthermore the chapter then discusses these findings with the results from the literature review to examine their consistency

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Chapter 6 - References This chapter contains the conclusions and recommendations that were derived on the subject of construction delays and links intrinsically to the aim and objectives. Furthermore recommendations are provided for preventing delays in future construction projects and areas for further research are also identified within the chapter.

1.3 Aims & Objectives

Aim: The objective of this dissertation is to identify if the use of BIM in the construction industry is going to affect the future role of the quantity surveyor. Objectives: To understand what is BIM To Research into whether BIM will help aid the Quantity Surveyor To Research into whether BIM will affect the role of the Quantity surveyor To summarise, analyse and evaluate the data collected in order analyse how the use of BIM will affect the future role of the quantity surveyor. Critically analyse the data collected from these questionnaires by comparing theoretical conclusions with the empirical

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research findings to draw conclusions. To prepare a questionnaire to collect data from practitioners within the construction industry in the UK in regards to whether the use of BIM will affect the future role of quantity surveyor. Clear objectives are important to determine whether this study is achieving what it set out to do. It is also important to write program objectives as specifically as possible to provide program clarity and strong links to evaluation. " It is much easier to evaluate a program when clear objectives have been developed" (my peer 2012). Subsequently, if the projects aim and objectives are achieved by this research, this would be useful to figure out whether the use of BIM will affect the future role of the Quantity surveyor.

1. 4 Restraints & Limitations

The main restraint is the access and use of BIM software as a full time student I do not have access to BIM software available within some construction companies. Archicad or Autodesk will need to be used to understand fully what BIM is and how it works; a student version can be downloaded online. The research will involve the use of academic materials such as textbooks, journals, published and unpublished documents and internet sites shown further on in the study in section 3. 4. The data analysis will be carried out by sending out an online questionnaire to two contacts working for a consultant and contractor respectively. I made acquaintance with these two contacts from previous work experience. Another restraint is how many people answer the online questionnaire; the more people that answer the questionnaire will be beneficial within the analysis as a greater number of people will give much more accurate results. Many of the potential individuals who will carry out the questionnaire may have busy

schedules so research must be taken into ensuring that questions are suitable and are able to draw suitable responses from at the end. It will be hard to measure how many construction companies currently use BIM and whether it is having an effect on the role of quantity surveyors working within the construction industry as there isn't enough time to gather research from every construction company around the UK. Throughout the study an open mind will be maintained whilst undertaking the research and analysis of the data collected.

1.5 Research Beneficiaries / Discrimination

This research will be useful into identifying whether the use of BIM will affect the future role of the quantity surveyor or aid the future role of the quantity surveyor. And to also identify what specific ways the quantity surveyor may benefit from using BIM and in what specific ways the quantity surveyor may be affected by the use of BIM in the future. Other categories to benefit from this research include the researcher, students and academics. By undertaking this research companies and people working within the construction industry can have a better understanding on the use of BIM approach and how it can be implemented within the cost estimation stage of a project and also into different phases of a project and the views of other professionals working within the UK construction industry on this application can be found and thus can implement that application effectively for the success of the project.

CHAPTER 2: LITERATURE REVIEW

2. 1 Introduction

In this chapter 2 of literature review, a critical literature has been conducted about how the use of BIM can aid the role of quantity surveyor and how BIM may be a threat to the future role of the quantity surveyor.

2. 2 Role of the Quantity Surveyor

2. 3 Building Information Modelling

Constructionbusinessowner (2012) provided information that BIM allows early collaboration and integration of the design information in a 3-D environment programs are widely used in the early stages to eliminate potential issues that would be costly to rectify in the field. All parties involved benefit. Designers can identify and correct design issues before they result in rework and schedule delays. Contractors have more reliable information and can better plan for equipment use and construction sequencing. Owners can " walk" the project in a 3-D environment during the design. And facility managers can pinpoint ergonomic issues and plan maintenance activities more efficiently by sharing the model with their vendors and contractors. BIM will only benefit users if it leads to improved design, faster delivery, reduced price or improved value. A combination of these factors will dictate how successful BIM implementation will be in the coming years. When all members of the construction team work on the same model, from early design through to completion, changes are automatically coordinated across the project and information generated is therefore of high quality. The construction industry is widely acknowledged as unique and conservative. Building Information Modelling (BIM) systems have the

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potential to revolutionize current practices and to automate the measurement of quantities from construction drawings. However, there are fears that such developments could threaten the future role of the quantity surveyor.

2. 4 Advantages of BIM

The application of BIM has the result of many advantages, such as:

2. 4. 1 Greater speed

The multi-dimensionality of BIM allows various deliverables and documentation to be prepared simultaneously to the design of the building. Furthermore, the use of object-oriented design and the re-use of information accelerate the creation of drawings (Ashcraft, 2007) REFENCED. Changes made to a certain aspect of the model or the design will be automatically updated through the rest of the project, which allows for major time savings.

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2. 4. 2 Lower costs

Sabol (2012) provided information that BIM offers the capability to generate take-offs, counts and measurements directly from a model. This provides a process where information stays consistent throughout the project and changes can be readily accommodated. Building information modelling supports the full project lifecycle and offers the capability to integrate costing efforts throughout all project phases. According to chuck Eastman (2011) at any stage of the design, BIM technology can extract an accurate bill of quantities and spaces that can be used for cost estimation.

2. 4. 3 Uniform design base

With traditional methods every stakeholder uses the same information but interprets it in a different way and enters it into a different format. As this information is exchanged between different parties, errors might be transferred with it. " BIM ensures that all parties work on the same base model, that coordinates building objects created across various disciplines which will quickly expose errors" (Howell and Batcheler, 2005 p. 58).

2. 3. 4 Drawing fabrication

All floor plans, sections and elevations will be accurate and consistent with one another, as they are produced directly from the same model (Howell and Batcheler, 2005, p. 64).

2. 4. 5 Cost Estimation

Cost estimating is currently a time consuming process, requiring an entire team of estimators. Acebytes (2012) provided information that there are multiple factors hindering the transition to model-based estimating; however, the risks are justified by the benefits of estimating with BIM. Building Information Modelling has the capability to automate a quantity take-off, which will reduce the time and costs required to estimate a project. By using a building information model instead of drawings; the take offs, counts, and measurements can be generated directly from the underlying model and the information can be linked to generate bills of materials, size and area estimations along with other related estimating information. According to Hardin (2009) another strategy for leveraging BIM during a

project is to use the BIM file for updating estimates very quickly, last minute design changes can be altered and updated much more quickly than typical take off methodologies can catch up with.

2. 5 Considerations and Limitations of BIM

BIM has the potential to improve the communication and coordination between the different stakeholders of a project. BIM's benefits range from simple improvements in efficiency and coordination to greater client satisfaction. With all of the perceived benefits of BIM, AV professionals should also be aware that there are a number of Considerations and current limitations that must be taken into account.

2.7. 1 Cost of Software and Hardware

Every organization currently utilizing 2D or 3D CAD drafting software can attribute a cost element against purchasing, maintaining and upgrading software licenses to keep a competitive market advantage. Current trends show that the cost of BIM software packages tends to be more expensive than CAD software packages available on the market. With the introduction of BIM software, the requirements on hardware have increased significantly. Currently, CAD software can be operated (with limitations) on a vast majority of professional laptops. Yet with the introduction of BIM software, dedicated high-specification workstations, equivalent to those required by advanced modeling and rendering software, are required. Software and program requirements are ahead of hardware availability. With BIM software, it is essential to know exactly what parameters of the hardware improve performance and what elements have no major effect at all.

2. 7. 2 Cost of Training

With new software, there is a great demand to train staff quickly so that the investment can be justified. It

is not realistic to assume professionals with CAD proficiency will be able to learn new BIM software quickly or without specialized training. Given the fundamental differences between BIM and CAD, training should be considered a requirement for all professionals involved with designing and producing documentation. BIM provides the ability for every member of the team to be involved in the design and modelling process, giving them complete control of the end product. Investment in training for early adopters provides them a competitive edge with projects that have clearly specified requirements to be documented utilizing BIM.

2. 7. 3 Compatibility between Software Platforms

One of the biggest issues with early adaptors of BIM is the issue of inter-product compatibility. Due to the relatively new nature of the market, every software manufacturer is doing something different with its software. This interoperability challenge can make it difficult for projects to function if different team members own different software packages. This interoperability issue is not limited to different software platforms; due to the rapid development of the BIM software industry newer versions of programs within the same platform can have interoperability issues. One alternative to the current product-specific models is a vendor-independent, neutral-file format. One such file format is the Industry Foundation Classes (IFC) format which captures both geometry and properties of intelligent building objects (objects with associated usable metadata) and their relationships within Building Information Models, thus facilitating the sharing of information across otherwise incompatible applications.

2. 7. 4 Innovation

Since a goal of BIM is to assign constraints and parameters to intelligent objects to improve efficiency, there is a potential to inhibit innovation which would possibly otherwise occur without

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the automated processes and shared knowledge that BIM now provides. Those firms implementing BIM should view the parameters and metadata constraints as a global database that allows designers to save time associated with updating and configuring product-specific data repetitively on different projects, hence increasing the amount of time spent on system design and innovation.

2. 7. 5 CostBuilding Information Modelling (Outlaw 2012) provided information that BIM models will require significant investment from those across the industry. There will be the direct cost of the software and hardware but also indirect costs such as training and obtaining suitable bandwidth to handle BIM data exchange. Given the level of investment necessary, the industry will take a cost benefit analysis to decide on adoption.

2. 7. 6 OwnersOwner - owners are likely to pay for the operation and management of the BIM, for example, appointing an information or BIM model manager. However, the owner stands to benefit most financially from BIM usage with both construction and operational savings.

2. 7. 7 DesignersDesigners will have to spend significant amounts on purchasing software, licences, hardware and training staff. There will also be costs incurred from obtaining insurance (with potentially high premiums given the collaborative nature of BIM and increased risk of collective design). However, designers will benefit from advanced design features, such as clash detection and value engineering tools. BIM also has a proven track record as a marketing tool, which provides a clear commercial advantage in any bid process.

2. 7. 8 ContractorsContractors - contractors will need to put funding in place to enable BIM software and support to be available on-site through tablet-PCs. However, only with such investment will they benefit fully from the increased level of information in the design, meaning that

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delay, extensions of time and variations will be less common. 2. 7. 9

Conclusion" A BIM model can overcome most of the most serious failings of conventional drawing-based design. It provides greater client certainty earlier: improved consistency and easier coordination of design documentation: improved, complete procurement documentation: much more powerful construction and project management tools: and much more valuable 'as built' and record information for the owner. The result will be substantiality more profitable firms of all types in the sector "(Ray Crotty, 2011, p. 57)Precisedraftunginc (2012) provided information that BIM requires more effort at the front end of a project to establish the initial framework. But the payoff is that you are able to extract a much higher quality and greater quantity of information from that model. BIM allows changes to happen easily, so clients may continue to make changes too late in the process, and that can impact construction and design costs. BIM results in much larger file sizes than traditional CAD systems, and requires higher performing computer hardware to operate it effectively. BIM requires more thoughtful design. We now have to do what all good designers have done in the past: Think in 3d and visualize the final product!

2. 7 Who is currently using BIM?

" NBS surveyed over 6, 500 construction professionals in the UK with over a 6% response rate" (Thenbs, 2012). Those asked said they believed a quarter of the industry will use BIM for the majority of projects in one year's time and a half will use BIM for the majority of projects in three years' time. BIM survey - who is using and intends to use BIM(Table 2. 6. 1: BIM Survey-Who is using and intend to use BIM, 2012)As shown in fig 1 the survey shows a

clear split in the industry. There is a gradually increase in the respondents who intend to use BIM for all projects over the next 5 years. This reflecting in the gradual drop in respondents who intend to use BIM for a minority of projects over the next 5 years.

2. 8 The Cost Management Functions of Building Information Modelling

2. 8. 1 Bills of quantities

Bills of quantities are one of the main tools used in the cost management of construction projects. The automatic production of bills of quantities is one of the functions that BIM technology developers pride themselves on as the fifth dimension of BIM. The automation of bills of quantities is one of the functions that enhanced BIM technology to be fully collaborative and integrative. " The primary and core component of the 5D concept is a properly configured 3D model of the building" (Popov et al. 2009, p. 16)." A properly produced BIM uses parametric modelling and object-orientated modelling to assign construction data, such as the physical properties and functional peculiarities, to each building element modelled" (BIM Journal, 2009). In order to demonstrate this, consider the following example: A door built into aR:

2. 8. 2 Cost estimates

BIM technology can extract accurate quantities and spaces that can be used for cost estimating at any period of the design of a project. Different information is applicable to different stages of the design phase, and advantage should be taken of information available and where not reasonable assumptions should be made (Eastman et al, 2008, p. 9). In the <https://assignbuster.com/bim-will-help-aid-the-quantity-surveyor-construction-essay/>

early stages of the design phase, when the design is still conceptual and limited information is available, cost estimates are typically based on a cost per unit or cost per square metre (Eastman et al. 2008). The BIM model can easily make available design variable information, such as the floor-to-ceiling height of each area, the perimeter/floor area ratio, the height of the building, etc which needs to be taken into account as it can have an impact on the cost per unit or cost per square metre rates." It should be noted that while building models provide adequate Measurements for quantity take-offs, they are not a replacement for estimating. Estimators perform a critical role in the building process far beyond that of extracting counts and measurements" (Eastman, 2011, p. 276).

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CHAPTER 3: RESEARCH METHODOLOGY

The main purposes of this chapter are to identify and convey the researchMethodology which has been selected to apprehend the questionnaire, which is essential to meet the research aim and objectives. In addition the chapter will also discuss the basis and thinking for selecting these specific methods. A combination of Quantitative & Qualitative research methodology will be used " Both qualitative and quantitative methods can be used effectively in the same research project" (Murray, 2003 p. 7). 3. 1 Quantitative researchAccording to Shamil Naoum, (2006 p. g39) quantitative research is based on a hypothesis or a theory composed of a variable measured and analysed with statistical procedures. Quantitative research enables the author to measure and analyse data. Benefitof (2012) provided information that the relationship between an independent and dependent

variable is studied in detail. The use of standard means in quantitative research means that any research may be replicated, analysed and also compared with other similar studies. Quantitative research allows for greater accuracy and objectivity of results gained. Quantitative research usually filters out all external factors and if well designed, it provides unbiased and real results. Quantitative research is a great method to finalise results and disprove or prove a hypothesis. It is useful for testing results gotten from doing various qualitative experiments, thereby leading to the final answer. Quantitative Research will provide the advantage of finding a premeditated set of result from a range of professionals in the construction industry.

3. 2 Qualitative Research

The qualitative research is defined as a research strategy which is set out often using the unstructured research approaches usually with a smaller sample size of carefully selected individuals to deduct non statistical insights into motivations, attitudes and behaviours (Wilson, 2003). Qualitative research is the method adopted for the inquiry in many academic disciplines, like in traditional social sciences. Different approaches used in qualitative research in collecting data are grounded theory, narratology, ethnography or shadowing, and storytelling. Qualitative research is the analysis of thoughts and feelings of people, some of the techniques used in data analysis are interpretive techniques, coding, recursive abstraction, mechanical techniques. The methods used by qualitative researchers for gathering information are participant and non-participant observation, reflexive journals, field notes, structured and unstructured interview, analysis of materials and document

3. 3 Advantages of Quantitative data collection:

Numeric estimates
Opportunity for relatively uncomplicated data analysis
Data which are verifiable
Data which are comparable between different communities within different locations
Data which do not require analytical judgement beyond consideration of how information will be presented in the dissemination process.

3. 4 Disadvantages of Quantitative data collection:

Gaps in information - issues which are not included in the questionnaire, or secondary data checklist, will not be included in the analysis
A labour intensive data collection process
Limited participation by affected persons in the content of the questions or direction of the information collection process.
(Reliefweb, 2012)

3. 5 The Questionnaire

A Questionnaire will be produced to obtain the data. Statpac (2012) provided information that Questionnaires are very cost effective when compared to face-to-face interviews. " Surveys are used to gather data from a relatively large number of respondents within a limited time frame" (Naum, 2006, p. 44). Questionnaires are easy to analyse, they are familiar to most people. They are less intrusive than telephone or face-to-face surveys. The results from the questionnaires will then be produced into bar charts and analysed. The questionnaire will consist of 18 different types of questions from closed ended, open ended, Numerical rating scale questions which will require the respondents to rate the answers, rating out of 5, 1= " least important" and 5= " most important". And ranking questions which will

require the respondents to place a set of attitudes or object's in ranking order indicating their importance. The main advantage of incorporating open questions within the questionnaire is " They give the respondents the opportunity to express their views" (Naum, 2006, p. 68)." Open questions can, however, present problems. As the open question offers no direct clues and is a broad base. Predictably this type of questionnaire is more difficult to analyse and interpret" (Naum, 2006, p. 69). By contrast, closed questions often require a short simple response in the form of Yes or No, Agree or Disagree, Important or Not important, etc. closed ended questions are easy to ask and quick to answer they also require no writing by either the respondent or interviewer and their analysis is quick and straightforward. The structure of the questionnaire will comprise of the first 7 closed ended questions asking the respondents simple questions comprising of their job role, how long they have worked in the construction industry, project location, project value and whether they have heard of BIM. Q 14, Q15, and Q 17 of the questionnaire are open ended questions which require the respondents to state their answer and there reasoning. 3. 6 Data

AnalysisThe majority of the questions in the questionnaire will be analysed by the use of graphs that represents the results of the questions, however due the questionnaire comprising of 3 open ended questions they must be analysed individual in a specific process" The best way to analyse open-ended questions is to code the information in terms of ideas and themes".

The purpose of coding such questions is to reduce the large number of individual responses to a few general categories of answers that can be assigned a numerical code. In order to analyse open ended questionnaires

the following steps can be taken: 1 Place all similar answers in a general
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category and assign them a code. Forexample, individual clients asked about the use of construction managementfor their projects might give the following answers:(a) We build large and complex projects.(b) We want to have good control on the project.(c) It is quicker.(d) Construction management provides high integration. All of these answers can be categorised under ' favourable to constructionmanagement'. Other clients might give the following answers:(a) We build housing projects.(b) We are not sophisticated clients.(c) It is too risky.(d) It is not a straightforward process as with the JCT contract

3. 7 Data Collection

Within this research, to achieve the objectives a quantitative approach is being implemented by a structured questionnaire to obtain the information from various people within the construction industry who work or who have worked as a role of a quantity surveyor/ estimator. This research is structured in such a way that to start with a pilot test of the structured questionnaire is prepared so as to enable the practicability of the proposed questionnaire applicable to the study. The data collection process is applicable to the complete researchThe questionnaire was uploaded to www.freeonlinesurveys.com once the questionnaire was produced the website then created a UR in which I copied into the email, the email was sent out to two contacts In which I made acquaintance with from previous work experience. Along with the link to the online questionnaire a covering letter in which " kindly forward this email to your work colleagues" was added to the introduction this would provide a greater number of respondents. The cover letter also stated the purpose of the research and even giving an

assurance to the companies that all the information they provide will be considered as confidential and is purely for only academic purpose. The questionnaires were sent out via email on Tuesday 12th February 2013 to a construction consultancy in Birmingham (Rider Levitt Bucknall) and a contractor in Birmingham (kier construction). By using an electronic means (as e-mail) will ensure a speedy process in despatch of information rather than sending them by postal service thereby saving time. This method will aid within the analysis of the results as the research will be gained by both contractor and consultants and a deeper and more accurate conclusion will be gained at the end of the study. The nature of the data required will be based on personal opinion from a range of construction professionals working within a construction consultancy and a construction contractor.

3. 5 Resources

The main type of research that will be used for this study will be applied research, the following resources will be consulted:

3. 5. 1 Text books
Various text books will be consulted as well as a series of electronic books. This will be one of the main sources of information
3. 5. 2 Journal articles
Journal articles are usually more easily obtainable as they are more freely available in electronic form which is easily accessible via the internet. It will also serve as a main source as journals and articles hold the most recent information on the topic.
3. 5. 3 Electronic resources
Various electronic resources will be consulted, as information is easily accessible through the use of a variety of search engines.

3. 6 Data Analysis

The data collected from these questionnaires will be critically analysed and summarised and all the data is interpreted in charts and logical style format. From these statistics a logical argument is drawn from the results obtained from critical comparison with the findings of the current literature. This is mainly to have a better idea of what their thoughts and views in person. The objective is to unravel the data and present it in an academic format that is credible to professionals within the construction industry. In doing so it will emphasize key variables and whether the use of BIM will affect the future role of a quantity surveyor and how, and to also understanding the usage of BIM, establishing if any drawbacks, benefits are present; which can then be formulated to become educational information. Finally, from these statistics a logical argument is drawn from the results obtained from critical comparison with the findings of the current literature. From all these approaches we can draw a conclusion and possible recommendations shall be made from the research findings so as to validate on if the use of BIM will affect the future role of the Quantity surveyor.

3. 7 Summary

In this chapter of Research Methodology, by discussing about the different type of research methods such as qualitative and quantitative, the quantitative type of approach with an closed structural questionnaire survey has been chosen for this dissertation as this type of approach would be the best suitable one with respect to both time and approach and mostly all these questionnaires has been sent through E-mail as to reduce the time span and to choose much more IT services effectively so that the respondent

should be flexible to answer the questionnaire. The responses collected are being represented in a charts and logical style format so as from these statistics the data can be compared with the literature review and make a conclusion accordingly.

CHAPTER 4: RESULTS

4. 1 Introduction

This chapter is mainly intended to cover the results in detail from the questionnaire sent to the various construction professionals within the UK via email. The online survey ([www. freeonlinesurvey. co. uk](http://www.freeonlinesurvey.co.uk)) produced the analysis automatically. The questionnaire data has been broke down critically by representing in graphs and tables. To cover the results in detail gained from the questionnaires that were sent to the various construction professionals working within the UK construction industry. The results have been present in a statistical format by the use of MS Excel and Ms Word.

4. 2 Results Explanation

4. 2. 1 Respondents size
The questionnaire was distributed to two contacts working within for a contactor and a consultant the two contacts forwarded the email on to their work colleagues. In which there were 30 completed responses. Out of these 30 questionnaires 37 complete responses have been obtained and 13 responses were incomplete responses. There were 20-30 completed respondents
Number of questionnaires originally distributed:
Sample Size originally distributed = 79
Response received (complete response) = 37
Completed responses received: Number of incomplete Responses = Chart 1: level of knowledge and awareness of Building

Information Modelling (BIM) approach in your company

4. 2. 2 In order to find the level of knowledge of BIM, firstly in the questionnaire a question is being intended to ask the respondents to mention their level of knowledge of Building Information Modelling approach. The responses were shown in the below figure graphically

Chart 2: which of the following best describes your role in your company?

Chart 3: You work for?

4. 2. 3 This question is mainly intended to find out the professional expertise of the respondent who is answering the questionnaire so as to find out of each individual views accordingly in respect to their profession. The following figure shows clearly the no: of responds in different fields within construction industry.

Chart 4: Project Location - UK Region

4. 2. 4 4. 2. 6 Project values

Chart 7: How long have you worked in the construction industry

4. 2. 8 Have there been projects you have bid for in which BIM was a requirement? This question is mainly intended to ask the participant professional to find out whether the BIM has been a client requirement of else anything. Out of 37 responses 11 responses have said that BIM has become as a main requirement by the client and about 57% i. e., about 21 respondents have answered as 'sometimes' and only about 14% (5 people) respondents said that it was never an requirement by the client. In the below figure it can be shown graphically

Chart 9: There has been an increase in demand on the usage of BIM in present construction industry

4. 2. 9 4. 2. 10 4. 2. 11 4. 2. 12 How satisfied are you with the current usage of BIM within your projects? This question is mainly asked to the participants so as to give their extent of satisfaction on the usage of BIM in their projects, there by the success rate of BIM usage can be analysed. The responses were shown in the below figure graphically for better understanding. Out of 37 responses, 8% were very

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dissatisfied and 8% more respondents have not satisfied which makes out of about 16% of respondents have not been satisfied on the current BIM usage in their projects and about 22% of respondents have taken the stand of Neutral as they really can't decide. But a majority of respondent's i. e., 62% of which 30% are very much satisfied and 32% are satisfied which makes BIM a success in their projects.

4. 2. 13 what are the main benefits for Quantity Surveyors using BIM? This question is mainly intended to get a clear idea of what were the benefits realised by a participant professional according to his company in relation to the BIM approach. In this question the respondent is given an option to select multiple benefits that were realised by his/her company. In the below figure clearly the responses were shown in graphical manner for better understanding.

4. 2. 14 4. 2. 15 4. 2. 16 4. 2. 17 Do you think that the use of BIM is beneficial within the estimating process? , Please answer Yes or No then state your reasoning.

Yes i believe it would be, much more efficient than a quantity surveyor

Yes i believe the model is extremely beneficially not only for calculating the cost of the building but also the 4D image, the specification, and information regarding that particular material, this saves on vast amounts of paper work which may be lost and take extra time to reproduce.

YES- quicker & efficient

Yes i believe it save significant time compared to manually take off and manual input from the Quantity Surveyor

Yes, if relevant information is put into the BIM model greater accuracy can be achieved within the estimating process.

yes I would think so, but as I'm not a QS difficult to say

Yes, immediate quantity take offs

No direct involvement

Yes - flow of information at early stage.

Yes - I makes it easire to visualise the building and key junction that could incur costs. It asks questions of the desing team to detail difficult junction earlier in the

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project. it will ask more questions during the tender stage than previously It will assist contractors to value risk as part of their tender submissions Yes - 5-D benefits and time since instant costing Yes, costs can be quickly updated as plans progress Yes as it will help enable rates to be compiled quickly, to enable accuracy. Yes, BIM provides a quicker process in terms of identifying key details that in turn will allow Estimators to produce more rigid and compliant tender bids Yes. You can control many more key factors in order to provide a good estimation. No :- As a building surveyor it will not affect me. No - Early cost estimates will not be carried out using BIM as clients do not want to spend the time and money creating models if the projects in the end are not viable. Much easier, quicker and cheaper to produce a plan drawing and an initial cost estimate then build a model at a later date if required to complete BOQ's. Also responsibility of the models contents is a concern? If there are missing elements in a Bill taken from a BIM model who is responsible QS or Architect? Not enough case law yet as too early / not tried and tested. Yes, it allows for a much greater accuracy Yes It saves times, reduces errors and re measurements. Do you think that the use of BIM will affect the role of a Quantity surveyor? , Please answer Yes or No and then state your reasoning. Yes i think Most if not all Quantity Surveyor will be using BIM within the next 5 years. Therefore the Q. s will have to adopt the use of BIM or face not being able to gain future jobs and valuable knowledge. no- there will still be a role for the inputting of measurements, data, costs etc. however the job responsibility and day to day tasks of the normal Quantity surveyor may change slightly. Yes- however i think the Quantity Surveyor will adopt the use of BIM and work with it to produce accurate and efficient take offs and cost plans Yes, the role of the QS will become redefined <https://assignbuster.com/bim-will-help-aid-the-quantity-surveyor-construction-essay/>

with a more efficient output. Yes, all main consultants are required to use it on my projects, they won't get a choice. No, architects and designer will not accept the responsibility and additional work needed to build a BIM that would negate the role of a QS. Cannot comment as I have had no formal experience with BIM. Not certain at this early stage. Yes. Client will demand it as a tool to make the valuation process easier for them. Yes - reduce demand for QS and reduce their input, thus overheads/site on cost. Yes, with BIM being a requirement with ever more contracts it will affect the role of a QS. Yes. I believe BIM will affect the role of a QS by not requiring them to manually take off work. However it will positively affect the role as more time can be spent on procurement and tendering strategies. Yes - it will provide a quicker process of measuring and taking off of certain materials and subcontract packages. Yes. QS will have to adapt to this new tool so as to improve communications and reduce timescales within a project. Maybe too early to say. Yes. Estimating and measuring components will become computer based. Yes, as a tool BIM, if used correctly will be more reliable, as like any other computer software programme. However, I'm sure the role of the QS will adapt as BIM is slowly introduced to the industry. Yes. The Quantity Surveyor will have to adapt to using BIM as there will still be a job to input the measurements and materials. Do you believe that the use of BIM can reduce costs within the cost estimating stage? , Please state why for yes or no. Yes , Computer model is quicker and more reliable than a quantity surveyor. Yes I believe costs can be reduced as less mistakes are made due to using a computer model. and also achieving better quality and specification as each component of the building is measured and cost calculated, providing a better overall finished project for the client. Yes as it produced

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quickly & automatically , However the cost of the BIM software, training and maintenance may however increase professional fees. yes i believe it can as with BIM it enables quick and very accurate measurement and costs, there is also a chance of human error compared to errors within a computer model, a error is only created which has been inputted into the model.

Unsure if you mean QS related costs or construction costs. Yes, but I'm guessing as I'm not a QS, it certainly makes getting hold of info quicker. Yes, fewer hours spent in this area as a result of BIM. Cannot comment as i have had no formal experience with BIM. Not certain at this stage. Yes- save on contingency since less errors & wastage. No it will cost to implement and the cost of training people to use it will outweigh the benefits. BIM will also struggle to cope with variations of working. Yes in terms of all aspects of the project can be accounted for and prices (as opposed to Provisional Sums for the unknown) but that can also increase the overall Tender Sum. Yes. As I said it will improve communications within the project team and reduce timescales. That means cost reduction. No - You may reduce cost of the QS due to reduced time taken to measure but will potentially increase cost to Architect as they have to produce BIM model. No because of the initial set up costs and training it limits SME current market ability. Yes, time saving costs. yes The use of BIM can help within the estimating process as it is done faster and more efficiently. 4. 2. 184. 2. 19

CHAPTER 5: DISCUSSION OF RESULTS

5. 1 Introduction

This chapter 5 mainly discusses the analysis made in chapter 4 and from those detail analysis the main research problems are being selected and

discussed in detail in relation to the literature review. In this chapter an outline is created on the major findings and how these can be such an important factors in the present project are explained and suggestions are being made for future research if needed

5. 2 Analysis of the results

From all these questions in the questionnaire, an outline of the research findings can be formulated by analysing the results obtained to this questionnaire. The main research findings in this research are: BIM has been widely used in all sectors within the construction industry. Better quality and collaboration between all parties within the project can be achieved by BIM approach. Now-a-days BIM has become a mandatory requirement by the client. Cost savings and reduction in time are the main benefits identified by e-procurement approach. E-procurement is lagging in construction industry and the lack of upper management support has been proved to be main drawback in implementing e- procurement. BIM approach can be possible solution for nullifying the problems in procurement process.

5. 3. 1question-----

In relation to the question posed to the companies with regard to their areas of application of BIM approach their projects, the best way for drawing a conclusion for this question would be analysing these responses according to the size of companies and their approach in relation to BIM. When we see on a whole a major respondents have selected architectural designing and structural designing as the major areas of BIM approach but when we classify these responses according to the size of companies,

5.3.2

CHAPTER 6: CONCLUSION AND RECCOMENDATIONS

6.1 Conclusions

The aim of this research report was to study the influence of BIM on the quantity surveying profession. One of the most apparent and vital consequences that will result from implementing BIM into the quantity surveying profession is the effect that it will have on the traditional roles and responsibilities of the quantity surveyor and the structure of quantity surveying firms. BIM's capabilities of automating the production of bills of quantities, which is one of the quantity surveyors fundamental tasks, will have both positive and negative effects on the quantity surveying industry. The automatic production of bills of quantities will enable quantity surveyors to get involved in the early design stages of a construction project and make designers aware of cost implications and manage costs from early on. This will enable designers to design to a cost instead of quantity surveyors costing to a design, which will satisfy the employers need for cost effective construction. In the past measurement was usually undertaken by senior quantity surveyors, but over the years it has diminished into a task delegated to more junior personnel while professional quantity surveyors take up more strategic roles (Ashworth and Hogg, 2007). With BIM automating quantity take-off, junior quantity surveyors will not play such a significant role in quantity surveying firms as before. This could change the need for large production teams in quantity surveying firms and cause quantity surveying firms to become smaller. The reduction in labour hours

and human resource due to the automation of this vital task can have an impact on the professional fees earned by quantity surveyors. As fewer resources are placed into the production of cost information, professional fees will have to be adjusted accordingly. The time saved by BIM capabilities will give quantity surveyors the opportunity to develop and focus on other activities that might not be seen as essential intraditional practices, but that will offer major benefits to employers. Newservices can be rendered by quantity surveyors such as managing the vast and continuous data exchange between the different consultants of a BIM based construction project, or they can specialise in existing practices such as value management. The continuously changing and technologically evolving construction industry has forced quantity surveyors to evolve with it in order to meet these ever changing needs. The research in this report has confirmed this statement, and has shown that BIM, although a great advantage to the construction industry, will oblige quantity surveyors to keep reinventing themselves and develop the scope of their services in order to maintain their leading role as construction cost managers. The audiovisual professional has an opportunity, with BIM and ultimately IPD, to add more value to the project team. BIM and IPD are both important revolutions in the construction and building management industries, and firms that can quickly become competent adopters will have an edge on the competition. With increased profitability, reduced professional risk, less waste, less rework and improved efficiency, audiovisual firms can use BIM to create new revenue streams and add to profitability. BIM will be the main method in which buildings are constructed and managed. It is crucial for audiovisual firms to become early and professional adopters of this technology and embrace the <https://assignbuster.com/bim-will-help-aid-the-quantity-surveyor-construction-essay/>

associated cultural change to ensure the growth of our industry. Infocomm (2012) provided information. Although work is required initially to develop the skills and processes needed to integrate BIM and QS processes, the resulting benefits undoubtedly justify the investment. Recent years have witnessed the realization of many of the ideas of BIM visionaries, and the next five years will see increasing numbers of successful implementations, changes in the building industry, and new trial uses and extensions of what can be achieved with BIM, beyond its use today. This period will see the transition of BIM to accepted mainstream practice; and the transition will impact all building professionals and participants. But the greatest impact will be on the individual practitioner, who will need to learn to work, design, engineer, build, or manage with BIM. (BIM HANDBOOK DESKTOP) Estimators have to access the risks of the project and with BIM you can be more sure of the correct-ability of the drawn material and the demonetised possibility of errors under the build. The question is only how soon they will be liable to correct their ways of working with the same present advised. It will only take one company to burst the bobble - all of the sudden all eyes will be turned to the contractor who went 5-8% under all the other tenders. The companies left behind still stuck to the 2D system will never know what hit them and will very soon have to turn the key. " In practice this is time-consuming both for contractors and sub-contractors, and the amount of paperwork had increased immensely. Nevertheless, contractors always need a " bill of quantities", whether produced by the clients quantity surveyor, by an in-house commission or by sharing the services of an independent quantity surveyor." There will be a higher demand to the contractors to be able to build accordantly to drawings as a model can be pulled out and digitally

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measured. They will have to be more accurate in their tenders as the possibility of extra works cause of quality on the drawings will be higher.

6. 2 Recommendations

From the research, the possible recommendations that can be suggested are: The usage of the BIM must be made in all sectors of construction industry rather than sticking to only some areas so there by increase the effective in the projects especially in small scale industries where they use it only for mainly architectural design and structural designing. The construction industries who felt the procurement process is lagging when compared to other sectors must be ready to implement the new BIM approach to achieve the benefits. The clients should also be very precise in selecting the contractors and subcontractors as when they intent to make use BIM approach in their project, they should make sure that all the people he is employing should be well aware of this BIM approach so that a good collaboration between all parties during the whole lifecycle of the project can be maintained which reflect on his project in terms of quality, cost and time.

6. 3 HYPOTHESIS

To incorporate BIM efficiently into the Quantity Surveying profession, Quantity Surveyors will need to focus on the following aspects: Updating software and computer systems in the work place Undergoing training on the cost management functions of BIM Adjusting their services and responsibilities to the cost management Functions of BIM Gaining knowledge on the new contractual aspects that is related to BIM on specific construction projects