A BIM Readiness & Implementation Strategy for SME Construction Companies in the UK

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Abstract

Building Information Modelling (BIM) is a new found reality by construction industry towards a Digital Built Envelope (DBE). Realizing its potential, UK government has made achievement of BIM Level 2 mandate essential for all publicly procured projects by 2016. Small and medium enterprises (SMEs) which form the backbone of UK construction industry are in perplex transition state as most of them are working on traditional project management workflows involving 2D drawings and production and possess silos oriented approaches. The push of government has forced the non BIM SMEs to transform and adopt the technology for long lasting results. The purpose of the research is to carry out an up to date analysis of recent BIM adoption state of UK construction industry SMEs, evaluate opportunities & challenges, and identify a suitable maturity assessment & implementation Strategy to upgrade their present skills and competencies. Both primary and secondary data is used in this paper. For primary data, UK construction SMEs professionals are the targeted groups of the survey questionnaire comprising 60 questions. For secondary data, the extensive literature review is obtained to gather considerable information. A case study of BIM implementation of Baxall Construction Company is also analyzed to glean into right maturity assessment and implementation strategy for a suggested template for wider SME organizations. The research employed questionnaire survey and interviews of top UK Architecture, Engineering and Construction (AEC) practitioners and up-to-date literature review along with a case study revealed that almost 75% SMEs are non BIM. SMEs still need to upgrade their staffs and skills (43%), quality assurance systems (80%), and IT software/hard ware systems (60%). As a yard stick construction industry needs to follow Integrated Design and Delivery Solution (IDDS) as a holistic BIM readiness criteria towards coherent BIM implementation strategy.

Keywords: Building Information Modelling (BIM); Small and Medium Enterprise (SME); Digital Built Envelope (DBE); Virtual Design and Construction (VDC); Integrated Design & Delivery Solutions (IDDS).

1 Introduction

Construction industry in UK is at the throes of a quantum leap towards a Digital Built Environment (DBE). Britain has a significant competitive edge in construction sector which has phenomenal growth potential especially in the backdrop of global construction market growth forecast of over 70% by 2025 (UK Government 2013). In order to remain at the forefront, UK Government has set out clear goals of 33% reduction in construction expenditure, 50% reduction in green house emission, faster delivery of assets and improvement in exports by 2025. The Government needs a complete collaborative 3D BIM throughout the life cycle of projects associated with digital formats by 2016, as an essential requirement for BIM Level 2 compliance on all centrally procured public projects (UK Cabinet Office 2011). This strategy has a phenomenal effect on UK Construction industry where companies are in a race to reach the mandate (Smith 2014).Traditionally, the construction industry has a poor reputation in adopting new technologies & innovation and possess a silo oriented approach (Gelder 2013). Construction contributes almost £ 90 billion to the UK economy in value added comprising 280,000 businesses and 10% of total UK employment, being one of the largest in Europe (Rees 2013). Despite UK's leading edge in advance construction technologies, its trade index in construction is not impressive with a trade deficit and shrinking of output by 4.5 percent year-on-year in March 2016 (ONS 2016). As per BSI (British Standard Institution) statistical release, SMEs make around 99% of all enterprises in the UK and also manage 59% private sector employment (Ward & Rhodes 2014). SMEs are at quite low levels of innovation capability due to fragmentation, limited collaboration and risk averse attitude (Goodridge, Haskel, & Wallis 2015) and break through can only be achieved through BIM (MGH 2014). Though technology transfer in smaller construction firms may be considered as a daunting task as compared to large companies, research study indicates that it is more viable and easier as these firms can assist the overall business at a faster pace with tangible results working (Barrett, Sexton, & Ghassan 2006). However, it must be recognised that most of the Small and Medium Enterprises (SMEs) in UK are BIM Infant; the terminology first highlighted by Jayasena (2013), as these have yet to start their journey towards BIM transformation. Moreover, most of the maturity models available in the literature might be less relevant to BIM infant companies and using an inappropriate BIM assessment & adoption strategy might result into waste of valuable time & resources. These aspects requires a knowledge based technology transfer BIM implementation Strategy which suits complex & continuous human interaction with the project teams (Barrett et al. 2006). Despite UK's leading edge in advance construction technologies like BIM, its trade index in construction is not impressive with a trade deficit of £8 billion in 2015 (Reuters 2015).

Around 48% of UK Construction industry is not using BIM and there is a major gap between confidence in potential advantages benefits of BIM and an understanding of BIM needs and how these can be transformed in their business processes (Kell, Champan, Waterhouse & Manning 2015). Moreover, presently less research is available in assessing organizational BIM Maturity in a BIM Infant SMEs, and how to bring significant changes to implementation by reinventing workflows, learning software's, training staff & assign responsibilities (Arayici, Cates, Koskela, & Kagioglou 2014). Existing Literature proposed various methodologies for embedding BIM into construction processes such as BIM protocol (AEC UK), and Mervin Richards' BIM standard framework, BIM implementation planning guide suggested by Pennsylvania State University, and RIBA outline plan of work (Sackey 2013). However, the challenge is that most of SMEs do not fall into any BIM Maturity level.

This study would identify & review various Maturity protocols & models and highlights the reasons why these models fail to address a BIM infant organisations. The study would then develop an appropriate theoretical implementation framework of execution into BIM Infant SMEs while considering enabling environment. The proposed research framework shall serve as a roadmap for embedding BIM technology in SMEs.

2 Research Methodology

The research study is designed as a practice oriented project with the purpose of chalking out a structured BIM implementation Plan template for overall BIM novice SME companies in

UK besides finding out a BIM Maturity Assessment tool for such organisations. In order to steam line the thought process for formulating a BIM enabling mechanism a multi-method data collection technique incorporating combination of qualitative and quantitative approaches was preferred to support the objectives of research and identify the maturity of SMEs. Data collection is resorted by surveys or questionnaires in a desk study approach. Within this research context, the questions of 'what' and 'how' are explored. Case study have been analytically studied to enable a right implementation strategy for a suggested template for wider SME organisations. The primary data is obtained from major construction industry practitioners through interviews, as well as archival records case study organization. A BIM questionnaire comprising 60 questions and holding 8 semi structured interviews both open and closed ended questions was circulated to fill in the gaps between the research studies.The key persons in UK construction SMEs were chosen as a selected sample representatives. Among these sample respondents included Chairman BIM Hub London, Managing Director Baxall Construction, BIM Manager Baxall Construction, BIM Manager O+W, BIM Manager WDR & RT Taggart, BIM Implementation Manager Kilcawley Construction, BIM Manager & KTP Associate Pentagon solutions and key appointment holder Queen University Belfast, UK.

3 Building Information Modelling (BIM) – Concept & Significance

In today's era BIM is being considered as a revolutionary change and harbinger of modernization of construction industry. BIM is a digital platform and described as bringing 'revolution in building design & technology' (Osan, Hule, & Gaitan 2012). A single, concise definition of BIM, in its ever evolving service might be difficult. Since most of the construction industry is BIM infant and yet to grasp its true potential, any attempt to craft a precise definition might lead to an omission. Notwithstanding, BIM handbook defines it as *computer aided modelling technology for managing & generating building information, with the related processes of producing, communicating, and analysing building information models* (Eastman, Teicholz, Sacks, & Liston 2008). The BIM thus forms an essential tool for real time decision making as it is spatial, measurable, comprehensive, and accessible that can be analysed (AGC 2006). BIM potential benefits in complete life cycle of a facility can be summarised in design, construction and operation disciplines and Capability sets into people, process and technology (Succar 2014). BIM stages of maturity can be described as pre BIM / BIM infant (Jayasena et al., 2013), object based, model based and integrated shared modelling management. Wang and Leite (2012) identifies use of BIM & Virtual Design and Construction (VDC) is improving management efficiency during design process. Avramides (2012) highlights the gradual shift of contractors towards initial design stage to harness benefits of BIM and significance of the nexus BIM, Integrated Project Delivery (IPD) and Target Value Design (TVD) emerges which propagates earlier collaboration, integration (Anon 2009).

3.1 Enabling Requirements – Level of Definitions

UK is taking lead from Bew and Richard (2008) approach towards BIM implementation at each stage of deployment. It is augmented by a maturity matrix, which identifies the degree of capability required at each stage with particular standards and their employability (BIS 2011). The identification of stages from 0 (non BIM) to 3 serves the purpose of technical and collaborative workflows and BIM linkages with processes, tools and techniques to ensure clear and concise understanding of project members (COMIT 2015). In 2014/15 UK Government further refined its requirements based on eight (HM Government 2013) *Publically Available Standards* (PAS) including: PAS 1192 - 2:2013, BS 1192 – 4:2014, PAS 1192 – 5, BIM, GSL (Government Soft Landings) and Digital Plan of Work (DPoW).

3.2 BIM Maturity Capability Models

BIM Maturity describes a ranking system encompassing all areas of effective modelling process to deliver the expected BIM product or service (Succar, Underwood, & Isikdag 2010). It not only serves a stepping stone towards installing the entire edifice of BIM implementation plan, but it calls for a wholesome review of several competencies, capabilities and readiness criteria's and devising it appropriately on case to case basis. There are number of BIM Maturity

Models like CMMI, (PM) ², SPICE, BEACON, VERDICT, iCMM and BIMMi etc (Haron, Amanda, & Aouad 2011). BIM Maturity Models are based on people driven, process driven and product driven (Giel 2014). Succar (2010) suggested model measures organisational BIM readiness by analysing & assimilating several models consisting of 5 level of maturity (Initial, Defined, Managed, Integrated, Optimised) and 3 key maturity category areas namely Technology, Process and Policy. NBIMS-US summarizes the BIM Maturity and performance measurement Models in terms of their intended users, rating context, evaluation style, measurement categories, and maturity levels. Six most common areas of evaluation in all models include BIM planning and Strategizing efforts, the use of technology/tools, BIM personnel's experience, competency and culture, BIM Management practices, BIM processes and operational use, Information requirements and geometric requirements see Table 1 for comparison of Maturity Models (BuildingSMART alliance 2015).

Table 1 Digital Comparison BIM Maturity Models Evaluation Criteria
(BuildingSMART et al., 2015)

Details	NBIMS US™I-CMM NIBS (2007)	BIM Comptency Index (BCI) Succar (2013)	BIM Maturity Matrix (BIMMM) Succar (2010)	BIM Proficiency Matrix IU (2009)	BIM Quick Scan Van Berlo et al. (2012)	VDC Scorecard/ bimScore Kam et al. (2013)	Owner Maturity Matrix CIC (2012)	Owner's BIMCAT Giel and Issa (2013)
BIM Planning and Strategizing Efforts		●	●		●	●	●	●
Use of Technology and Tools		●	●		●	●	●	●
BIM Personnel: Mentality, Culture and Individual Competency		●	●		●	●	●	●
BIM Management Practices, Infrastructure and Administrative Policies	●	●	●	●	●	●	●	●
Processes and Operational Use of BIM	●		●	●		●	●	●
Information Requirements	●		●	●	●	●	●	●
Geometric Requirements	●			●				●

Evaluation Context Used

Models | **Individuals** | **Organization/Project teams** | **Owner Organizations**

3.3 Integrated Design and Delivery Solutions (IDDS)– A Holistic Approach

It is introduced by International Council of Research and Innovation in Building and Construction (CIB) (Owen, 2010).The foundation of IDDS rest on Collaborative processes, enhanced skills, integrated information and automated systems and knowledge management.

3.3.1 Collaborative Processes

A BIM infant organisation with better collaboration has more capability to enable BIM as compared to the one with poor collaboration. Owen (2010) recognizes that silo mentalities and cultures beside document based information in the construction industry has made new set of working under BIM where there is heavy reliance on computer technologies almost redundant. Thus BIM Maturity Assessment framework need to look for immediate potential for collaborative process in non BIM organisation.

3.3.2 Enhanced Skills

The project teams need to have integrated skills in a new set of technologies and capabilities for collaboration. In a common data environment, the profession required enhanced skills in terms for integrated performance analysis, linking CAD with GIS data, computer aided visualisation, modelling, constructions sequencing, manufacturing, logistic planning and virtual prototyping. (Amor & Owen 2011).

3.3.3 Integrated Information and Automated Systems

Owen et al. (2010) supports IFC based interoperability instead vendor specific BIM tools and suggested project teams with special qualifications in each organisation to manage transfer of data. The professional need to have a vision to understand technology than the tools. A study by van Berlo (2012) also supports the same preposition where interoperability manager need to chalk out a framework for smooth and seamless transfer of data (Jayasena et al. 2013).

3.3.4 Knowledge Management

Most of the firms have limited knowledge management capabilities and tend to hide the issues than to resolve (Storck & Hill 2000). Maintenance of archives and lesson learnt are non-existent. In IDDS terms, knowledge management is the key including codifying, updating, upgrading work processes & awarding the workers.

Figure 1 IDDS and its Impact on Industry, Technology & People (Owen et al., 2010)

4 Case Study – Baxall Construction

Baxall Construction is a Contractor SME Company based in Kent since 1964. The Company delivers new build, refurbishment and build solutions to public & private clients in London & South East (Baxall, 2016). It is a tier 2 contractor having 52 Employees with a projects turnover of £20M. Baxall Construction commenced its BIM journey few years back in order to increase profitability, customer satisfaction, competitiveness and to remain in line with Government Construction Strategy 2025. In 2015, the Company was winner of the best newcomer category at the BIM4SME Award Ceremony held at Westminster Yacht Base (BIM4SME, 2015). Adoption of BIM assisted the company in driving out waste in design and to increase profitability and sustainability. Among various BIM projects, Holborough Lakes Primary School and Hakam Primary School projects indicates key implementation strategies. Hakam Primary Schoold is a design and build project in Pevensey, East Sussex, was commissioned to create modern teaching, classroom and welfare facilities. Baxall delivered a large two-fold extension including two classrooms, school hall, toilets, storage and a link was developed to join the existing school building, creating a new reception area. Awarded under the Sussex Cluster Framework, the original specification proposed a 42 week programme using traditional build methods. Later, an opportunity was realised for significant value engineering gains through the adoption of BIM & lean construction. Baxall construction after winning the bid offered the school a sustainable solution by off-site fabrication using the company's partner STREIF (Sustainable building design) system (STRIEF UK, 2015), an approach to significantly reduce the time to 6 weeks, budget (£250,433/ 18.6%) and whole life cost savings besides delivering

more sustainable and energy-efficient school facilities. A diverse early stage meetings and workshops took place between all contract parties to develop a robust strategy for the design and delivery of the school. Workshops were held with the delivery and STREIF teams to maximise the benefits of off-site construction and key sub-contractors to reduce clashes and benefit from the shorter on site construction times. Lean construction was achieved through utilising a 'Last Planner' system and incorporating training sessions with key sub-contractors on modern methods of construction. The project was benchmarked and monitored against a set of internal and Framework KPIs including the Construct CO^2 initiative.

Table 2 A Financial Layout – Hakam Primary School (Baxall et al., 2015)

Details	Value	Valued Engineered Services
Feasibility Budget	£1,344,000	
Baxall Contract Budget	£1,102,295	£241,705
Baxall Final Account	£1,309,567	£250,433 (18.6% savings overall) Reduction in time form 42 weeks to 36 weeks and 31.5 % Zero Carbon Emission Travel

5 Data Findings, Analysis and Results

5.1 SMEs BIM Maturity Assessment

Out of the SMEs surveyed, research analysis indicated that mostly SME Companies (75%) in UK are at BIM infant level, as their business processes involve 2D workflows, generally using AutoCAD, have some knowledge of BIM and have yet to start their BIM journey. Among them only 25-27% are using BIM Software and are knowledgeable about BIM. However, it is also visible that due to Government push, the management is aware of BIM level 2 targets and is committed towards implementation. From the interviews, findings remains the same as one of the respondent replied "*BIM is still in its infancy, so delaying implementation may not be a bad idea as BIM legalities, contracts, model ownerships, insurance, standards, collaborating soft wares are all being developed and are updated.*

5.2 BIM Readiness Criteria for BIM Infant SMEs

The BIM Readiness Criteria identified in line with IDDS (Integrated Design and Delivery Solution) is summarized in table below:

Table 3 BIM Readiness Criteria (Research derived from Owen et al. 2010)

BIM Maturity Elements	Readiness Stages	Readiness Criteria	Company Baxall
Collaborative Processes	Process Change	Redesign of Business Process Workflow	√
		Working on Project to Project	√
		Open & Liberal Communication	√
		Incentives	√
	Implementation Regime	BIM Implementation Plan	√
		Change Control Mechanism	√
		Resource Utilization	√
	Policy Change	Documents & Contract Amendments	√
Knowledge Management	BIM Strategy	BIM Objectives Formulation	√
		BIM Market Evaluation	
		Documentation of lessons learned	√
	Management Awareness	BIM Knowledge & Awareness	√
		Continuous Commitment	√
	Leadership	Vision & Motivation	√
		Top down approach	√
People – Enhanced Skills	Roles & Responsibilities	BIM Manager/Coordinators	√
		Design & BIM Team	√
		Giving Authority	√
	Skills Enhancement	Proficiency on BIM Modelling skills	
		Continuous Learning & Research	√
	Training & Education	Formal & informal Training	√
		On job Training	√

Integration information & Automated Systems	Hardware	BIM Residing Capability	√
	Technical Support	Continuous IT Support/ Cloud	√
	Software	Review & Updation	√

5.3 Perceptions, Awareness & Understanding

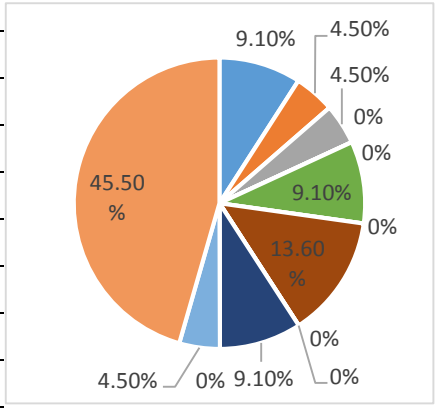
The survey identifies that SMEs Companies are generally aware of BIM standards, UK Government enabling requirements and work methodologies, however are somewhat hesitant to put it in practice besides not having understanding of implementation strategies. Approximately 60% SMEs have tailored their projects according to RIBA Plan of work using CAD format but yet to transform these on BIM processes. During an interview one of the respondent replied, "*Basically there is BIM confusion, ignorance and half-truth…*" other respondents supported the findings by saying that, "*PAS 1192 level 0 would involve an analysis of company & its external stakeholder…*", "*PAS 1192 suggests number of roles…role of information manager..*", "*It requires change in attitude to implement BIM*".

5.4 SMEs BIM Implementation – Opportunities & Challenges

The results of survey questionnaire indicates that 60% SMEs firms are willing to be BIM enabled since essential ethos embedded in their organisations with half percentage divided over the seamless integration of BIM training curriculum and roles & responsibilities .It supports the findings that still SMEs lacks standard operating procedures & implementation strategy to streamline the execution methodology The results augments the findings that SMEs still needs to upgrade their staff skills (43%), Quality Assurance systems (80%), and IT software/hard ware systems (60%). Mostly Common data environment being used is Union Square which is a non BIM environment and is only regarded as data management system.

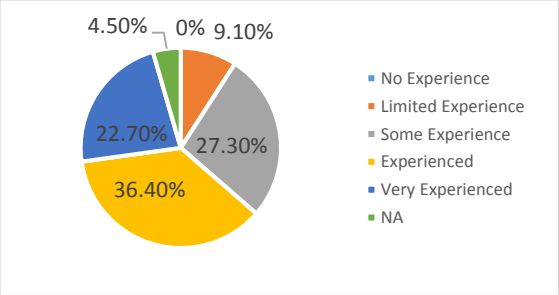
Table 4 BIM Maturity Assessment – A Sample Format of Questions & Analysis

Which of the following describes your current role in your organization?		
Quantity Surveyors	2	9.1%
Contract Manager	1	4.5%
General Manager	1	4.5%
Commercial Manager	0	0%
Administration/Information Data Management	0	0%
Site Managers	2	9.1%
Building Surveyor	0	0%
Civil Engineers	3	13.6%
Health & Safety	0	0%
Procurement	0	0%
M & E Coordinators	2	9.1%
Architect	0	0%
Design Coordinators	1	4.5%
Other	10	45.5%



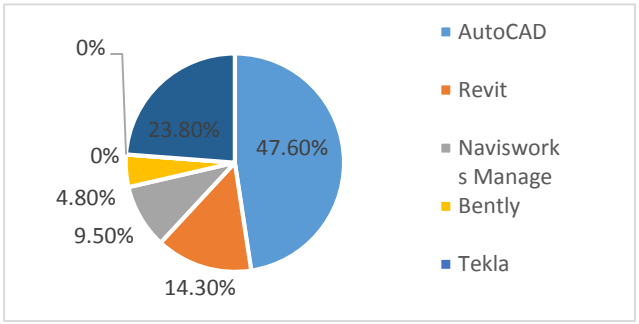
If you have used CAD or BIM Software in the past, how experienced do you believe you are?

No Experience	0	0%
Limited Experience	2	9.1%
Some Experience	6	27.3%
Experienced	8	36.4%
Very Experienced	5	22.7%
NA	1	4.5%



Which BIM/CAD Software did you use in the past?

AutoCAD	10	47.6%
Revit	3	14.3%
Navisworks Manage	2	9.5%
Bently	1	4.8%
Tekla	0	0%
Archicad	0	0%
Other	5	23.8%



5.5 Implementation Challenges, KPIs & Suggested Way forward.

AEC industry respondents felt that major challenges in BIM implementation in UK include high initial investment, lack of knowledge, lack of time, information retention across multi-software platforms, security issues, cultural change, lack of collaboration and extensive management skills. During review of archival records of Baxall Construction, the key challenges identified include resistance to change which the respondent said that, "*we overcome by bespoke workshops, training, presentations and demonstrating our business case of working more efficiently*", internal understanding & engagement of staff which he replied that, " *it was handled by highlighting the importance of BIM to staff, then following the NFB (National Federation of Builders) Learning Program, software training and engaging two BIM Hubs i.e. East Sussex and Kent*" and the Clients lacking clear understanding of what they want, which he said was overcome by "*effectively working with clients to work out Employers Information Requirements (EIRs)as set out in Publically Available Standard (PAS 1192), development of BEPs (BIM Execution Plan) and linking soft landings with the whole process*". Most of the respondents were unaware about the BIM KPIs (Key Performance Indicators) and few replied that these must be developed to measure the performance.

6 Broad Contours – BIM Implementation Strategy

6.1 Internal Persuasion, Brainstorming & Marketing

In order to enable BIM technology in a SME firm, brainstorming and internal marketing is mandatory. Then a deliberate maturity assessment is done to identify right skills & competencies among workforce. BIM implementation Champions having requisite enthusiasm to bring change in organisation need to be identified in each department, followed by BIM steering and advocate groups aiming to achieve buy in of the top management & rest of the staff thorough workshops, seminars & posters.

6.2 Developing a BIM Strategy

Developing a clear BIM Strategy assists in achieving vision and allow interoperability of BIM workflows for different departments besides setting long & short term goals for the departments (Panaitescu, 2014). It should guide towards implementation process. A Guide to UK standard BS 1192-2007 can serve as a general template for developing a strategy.

6.3 Constituting BIM Strategic Steering Group

Since the transformation process would take a long time, a BIM Strategic Steering Group needs to be formalized by consensus comprising strategic appointment holders in the Company to steer the enabling process as set out in BIM Strategy. This group should periodically monitor and steer the implementation at Company level.It should work in close harmony with BIM Advocate Group to initiate actions at tactical level including creating the shared object libraries, model storage and common structures besides mandated to allocate resources

6.4 Enabling BIM Champions

Top management supported by BIM Advocate Group should identify individuals who are dedicated, committed and have a positive attitude during internal marketing campaign (Panaitescu 2014). One person should be selected at tactical level – a project team member and one person (a senior manager) from operational level with an experience on working with BIM software. The main role of department BIM Champions is to enable BIM in their respective departments taking lead from Strategy & BIM Steering Group including centralizing BIM knowledge, collaborating intensively and doing internal marketing to convince colleagues of the benefits of BIM.

6.5 Making BIM Business Process Mapping & Developing Business Model

In most of the SMEs, the immediate BIM Benefits are not proportional similar to investments done in new technology during the transformation stage. Keeping in view, the Company's BIM Strategy, each department needs to develop a business process model on change workflows, reinvent the design process, install software and train project teams. Business model must analyze the extent of implementation costs, how BIM integrates with business structure, required skills to compete in the market and required knowledge of BIM for competing demands of contracts such as Design Bid, Design Bid Build and Integrated Project Delivery. It needs to be correlated with PAS 1192-2 and RIBA Plan of Work 2013.

6.6 Setting up Department BIM Implementation Plan

For a BIM novice SMEs, a BIM Implementation Plan down to each department level be formulated in coordination with BIM Advocate and Steering Groups including following steps in Table 5.

Table 5 BIM BIM Implementation Plan – Key Tasks & Activities

Key Tasks	Activities
Establish BIM Management	Appointing BIM Manager/Coordinator and delegating responsibility for BIM Adoption, ensuring all stakeholder are engaged including procurement.
Alignment Plan with UK level 2 BIM Compliant to PAS 1192	Defining of data and information requirements as laid down in BIM Standards including Response to EIRs, pre & post contract BIM Execution Plan, BIM Protocol, Implications for PI Insurance, Digital Plan of Works, Project Information Manage Requirements
Aligning People	Human Resource Development Plan, defining of new roles & responsibilities of project team members, shaping teams with adequate BIM modelling skills, assessing supply chain and roll out of appropriate training. Human capability should be build up in stages (working in small groups, working on pilot project or involving ½ or full workforce).
Aligning Processes	Setting up your internal company procedures and standards, managing of Common Data Environment, developing template documents, object libraries, coding & classification according to ISO 16739:2013, Compliance with BS 1192-4 use of COBie and model checking procedures.

Aligning Technology	Development of Technical Resource Plan incorporating BIM Software & tools, hardware, establishment of project interoperable data base BIM and object libraries in coordination with IT specialists & BIM Steering Group

7 Conclusion

BIM is the way forward towards a digital built environment. It increases efficiency in projects, optimizes the construction delivery & hand over cycle and reduces waste & carbon imprint. BIM has established its roots in UK Construction Industry and its adoption rate is steadily increasing especially in the backdrop of BIM Level 2 enabling requirements 2016. The mandate is serving as a catalyst to increase competitiveness in UK Construction industry. The Government has given a holistic set of guidelines & standards for transformation of the Industry from CAD to BIM. However, findings identify that around 75% of construction SMEs which form the backbone of construction market are non BIM. The SMEs which have already transformed to BIM, are far ahead than others. Integrated Design and Delivery Solution (IDDS) is a holistic model to check the maturity and present skills/competencies of the project members. Since this model not only looks at the initial non BIM maturity level of organisation but also holistically manage future readiness criterion as it matures. SMEs are facing challenges in terms of investments required, needed skills & competencies, slow return on investment, security of model and a mechanism to enable a BIM implementation Plan. Without a vision, strategy, business process mapping in line with PAS 1192 & RIBA Plan of Work 2013 and a structured implementation plan it is not possible to achieve BIM Level 2 mandate in UK.

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