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Purpose of the Series

The aim of this publication is to provide an opportunity for students to publish the findings of their undergraduate or postgraduate work. Guidance on publication will be given by staff who will act as second authors. It is hoped that by providing a guided transition into the production of papers that students will be encouraged throughout their future careers to publish further papers. Guest papers are welcomed in any field relating to the Built Environment. Please contact E.A.Laycock@shu.ac.uk. A template will be provided on request.

Acknowledgements

The editorial team would like to acknowledge and thank Will Hughes, Reader in Construction Management and Economics, University of Reading for permission to use the ARCOM template and the associated resources.

Editorial

Welcome to this edition of the Transactions. This is the largest edition so far and has taken a little extra time and resource to support those graduates who wanted to publish as solo authors. Year on year there is a slow but steady increase in the number of these papers written by students as single authors. This demonstrates the ability of our graduate students to deliver academically, above and beyond the Dissertation research work and to share their findings with their peers. I hope that some of them will use this experience to enable them to publish later in their careers. The papers look at the impact of legislation on practice, the mechanisms by which companies can maintain or regain a competitive edge and embedding good practice within construction businesses.

As always I am very pleasantly surprised by the quality of student submissions to the journal and interested to read the summary of their findings. Staff and students work hard and I would like to take this opportunity to thank them for their additional efforts for the journal.

Dr Elizabeth Laycock

Editor, Built Environment Research Transactions

CONTENTS

AN INVESTIGATION INTO THE IMPACT THE AMENDED HOUSING GRANTS, CONSTRUCTION AND REGENERATION ACT 1996 WILL HAVE ON PAYMENT PROCEDURES IN THE CONSTRUCTION INDUSTRY

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The Housing Grants, Construction and Regeneration Act 1996 (hereafter 'The Construction Act') introduced statutory rights for payment and adjudication on all construction contracts entered into on or after 1 May 1998. Parliamentary amendments altered the Construction Acts jurisdiction as well as its payment and adjudication provisions that apply to all construction contracts entered into on or after 1 October 2011. The Construction Act had a significant impact on the industry; however the full impact of the amendments is disputed within literature with many practical implications and benefits expected but not yet proven. Questionnaires and interviews were conducted to establish industry perceptions. There has been no initial impact witnessed by the construction industry, apart from the material re-drafting of contracts and training on the new provisions. The amendments have been detrimental to the Acts understanding mainly due to ambiguities, this is more prominent in construction companies than legal professionals, suggesting an issue in the actual practical application of the Construction Act. Despite no initial impact, there is evidence to suggest that over time the amendments will have a positive impact as per Government intention. After an initial transformation period payment provisions will become more efficient as a direct result of the amendments. Although there has been no initial impact found and the null hypothesis must be accepted, industry perceives the long term impact to be beneficial to the industry by providing more efficient payment processes.

Keywords: Construction Act, Legislation, Construction Law, Payment, Contracts.

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INTRODUCTION

Numerous Government reports have been commissioned into the ills of the construction industry, many to no avail (Joyce 1996). The Latham report in 1994 was the most influential and was received with industry acclamation (Chappell 2009). During the 1990's recession there was increasing pressure on Government to endorse legislative change, this resulted in the Housing, Construction Grants, Regeneration Bill (hereafter 'the Construction Bill') that passed through the House of Lords in April 1996, and later achieved Royal Assent from the House of Commons on 1May 1998 in the form of the Construction Act. The Act was based on Latham's recommendation [(Packman 2010, p.1) (Chappell 2009)] to enforce a 'Construction Contracts Bill' (Latham 1994, p.103). Part II of the Act refers directly to 'construction contracts' and introduced statutory rights for payment and adjudication that applied to contracts entered into on or after 1 May 1998. This was unique; there had never been legislation acting upon freedom of contract in the construction industry (DTI 2006, p.12). As a result the standard forms and secondary legislation were adapted, where a contract fails to incorporate the Construction Acts provisions the Scheme for Construction Contracts (England and Wales) Regulations 1998 (here after 'the Scheme') applies. In 2004, Gordon Brown the then Chancellor of the Exchequer announced, "Government will review the operation of the adjudication and payment provisions in the Housing Grants, Construction and Regeneration Act 1996" (HMT 2004, p.61). The Construction Act has been of crucial importance and led to major changes in practice (Chappell 2009, p.40). Therefore the effects of amending such an important piece of legislation, forms the basis for this research. Part 8 of the Local Democracy, Economic Development and Construction Act 2009 (here after 'the 2009 Act') is a piece of amending legislation which prescribes changes to Part II (s104-117) of the Construction Act (AIS 2011). The new provisions apply to all construction contracts entered into on or after 1st October 2011 in England and Wales and 1 November 2011 in Scotland (BLM 2011, p.1). The Amendments sparked debate within the industry, however literature was mainly centred around legal implications with little reference to the practical impact on the industry post implementation. As stated by Joyce (1996) "the [Construction] Act raises many questions, the answers to which cannot be predicted with any certainty" (Joyce 1996, p.1); although here referring to the Construction Act's original implementation a similar scenario arises with the amendments (Teichmann 2012).

In summary Part 8 of the 2009 Act amends Part II of the Construction Act to create a new set of provisions, hereafter termed 'the Amendments'.

LITERATURE REVIEW

An adversarial Industry

Conflict is endemic in the construction industry (Uff 1997). The dominant position of main contractor in the supply chain allows money to be held to improve cash flow and profit margins (Packman 2010). This, combined with the cost of traditional dispute resolution (arbitration and litigation), often prevented sub-contractors from pursuing

their commercial entitlement (Lynch, no date, p.2-3). The Department of Environment announced July 1993, there would be a joint review of contractual arrangements and procurement methods in the UK construction industry. Sir Michael Latham was commissioned to chair the review, and later produced the report 'Constructing the Team' (hereafter 'the Latham Report') (Latham 1994, p.35). Latham's main recommendations were for streamlined payment mechanisms and a faster more efficient method to resolve disputes. Latham made direct reference to the industry's legislative requirement stating that adversarial practices cannot be solved by continuously refining existing contract conditions, instead a set of standard principals should be formed that contracts can be based on (Latham 1994, p.84-85). Latham stated "A Construction Contracts Bill should be introduced to give statutory backing to the newly amended Standard Forms....Some specific unfair contract clauses should be outlawed" (Latham 1994, p.VIII). The Construction Bill progressed through parliament achieving Royal Assent as the Construction Act on 1st May 1998. The Construction Act consisted of five parts, Part II (s104-117) directly impacted 'construction contracts' requiring standard forms to incorporate mandatory provisions for any contract over 45 days in duration. Separate legislation was introduced for Scotland to reflect the differing judicial systems (Chappell 2001, p.193-195). In 1998 Nick Raynsford the Minister with responsibility for the construction industry stated "This legislation gives a right to fast and effective adjudication; it will make payment provisions more certain, and it will outlaw most pay-when-paid clauses.... I am certain that, if used sensibly, the legislation will be a huge benefit to the industry and its clients" (Lynch, no date).

The Impact

Immediately after Royal Assent in 1998 the Construction Act was seen as legislative interference with little benefit, criticised for being extremely porous and relying upon legal precedent to clarify the ambiguous drafting (Macaulay 1998, p.199-203). Over time the benefits prevailed, Rupert Choat believed the Construction Act was a significant success for all intended parties (Choat 2010, p.1), similarly Busby stated the Act has served the industry well for the past 10 years (Busby and Hamish 2009, p.26-28) and Arnold was in no doubt that it had achieved its general purpose (Arnold 2011). It was viewed by Tony Bingham as "….the most important act of parliament in our world of building and civil engineering…" (Bingham 2008). During the consultation in 2004 Rt Hon Alun Michael MP sensed that the construction industry recognised the value of regulatory review by Government (DTI 2006). Michael's view was supported by Choat who suggested there was industry lobbying particularly from sub-contractors (Choat 2010, p.3). Likewise Shaywer believed the Amendments were required to maintain its effectiveness in achieving its objective (Shaywer 2011). This support for the Amendments wasn't uniform, Newman suggested the Construction Act was working as intended and therefore didn't require amending (Newman 2001). This support may be a biased opinion from principal contractors who have redressed the Construction Act in their favour through legal precedent, this would relate well to the lobbying from sub-contractors not necessarily main contractors (Choat 2010, p.3).

Government consultation found that less than 10% of payment procedures were carried out with the correct notices, due to deficiencies in legislation (DBERR 2008, p.22). This data poses a valid argument for the review of the Construction Act.

Review and Consultation

In 2004 Nigel Griffiths MP the then Minister responsible for the Construction Industry commissioned Sir Michael Latham to Chair a review into how the Construction Act has developed in practice. Latham concluded the Construction Act was "...generally working well but there was room for improvement" (Latham 2004, p.24). The intention of Government was to pursue clarity of what, and when the payee will be paid and increase the effectiveness of statutory adjudication without unduly intervening into parties' freedom to contract. To achieve this two consultations were conducted, the first in 2005 mainly focused on the specific topics affecting the industry. The second in 2007 further investigated the responses from the first consultation, defining what the industry desired. Analysis of the second consultation subsequently allowed the 'Draft Construction Bill 2008' (hereafter 'the Draft Amendments') to be formed (DBIS 2011). The TeCSA stressed in their consultation response that amendments made to payment procedures need to be clearly stated, thus ensuring the Courts do not have to decide the validity of clauses and whether legal principle has to prevail over statutory policy. Courts require clear guidance on what constitutes adequate payment; if left objective with little direction problems will be inevitable when deciding what is or is not adequate (TeCSA 2008). Ambiguous clauses in the Construction Act gave rise to legal precedent, some of which undermined Government intentions. In the analysis of the 2007 consultation there was particularly strong support for the amendments to adjudication, however for payment procedures this was not so clear (DBERR 2008, p.8-9). This is due to the differing opinions of what clients, contractors and sub-contractors perceive as fair payment terms (Packman 2010).

Changes outside the payment narrative

Payment procedures were the chosen narrative, however it is important to acknowledge some of the wider changes that may impact construction contracts as a whole. Under s106 the Secretary of State may remove 'any or all' of the Amendments from a construction contract, this broadens the original power of all or nothing. Mr Justice Coulson suggested "it is not clear why such a power was thought to be necessary" (BLM 2011, p.2) and much will depend on how this power is or is not exercised. This power has since been exercised to form the Construction Contracts (England) Exclusion Order 2011 limiting the effect of outlawing pay-when-certified clauses (s110(1A)) on PFI projects. The 2009 Act repeals s107 in its entirety; originally s107 restricted the Acts application to contracts 'evidenced in writing'. The rationale being "only contracts in writing were sufficiently certain and clear for adjudicators to make speedy decisions" (Hickey 2011, p.5). The Amendments now govern construction contracts which are "wholly in writing, partly in writing or wholly oral" (DBIS 2009). This amendment is not to encourage more oral or partly

oral contracts and in the view of the DTI it is unlikely to do so (DTI 2007, p.20). Understandably the majority of commercial contracts are and will remain ‘evidenced in writing’ however the implication and the industry’s apprehension revolves around the inclusion of oral variations (Arnold 2011). S108 provides legislative clarity for correcting an adjudicators decision previously ruled in Bloor Construction v Bowmer and Kirkland (2000). An adjudicator now has the right to correct clerical or typographical errors arising by accident or omission within 5 days of the decision (TECBAR 2011, p.3). Previously established case law should minimise the impact of this amendment. The Construction Act was silent on allocating adjudication fees. A legal precedent was set in Bridgeway Construction Ltd v Tolent Construction Ltd (2000) that a clause stating "The party serving the Notice to Adjudicate shall bear all of the costs and expenses incurred by both parties in relation to the adjudication, including but not limited to all legal and expert fees" (Atkinson 2000), Honour Judge Mackay held that such “clauses were not void nor voidable” (Atkinson 2000). This gave rise to Tolent clauses that "allowed parties to use these costs as a barrier to referring the dispute to adjudication" (Bingham 2011). Government intended to outlaw Tolent clauses but the industry is sceptical to the robustness of its drafting; Court rulings will determine their interpretation. The ambiguous nature of this area and other amendments outside the remit of this research provides subject for further study.

Amendments to Payment Provisions

The Amendments made significant alterations to payment procedures in standard forms of contract (Fenwick and Elliott 2012, p.23). Whether a contract was entered into on or after 1 October 2011 will become significant for parties' payment mechanisms (TECBAR 2011, p.3). The view was taken across literature that the Amendments to payment provisions were the most far-reaching and substantial (Clarke 2011). Horne (2011) suggested that the key changes to payment procedures would be felt on a project perspective causing short-term disjoint on larger projects with sub-contracts running on different payment mechanisms (Horne 2011). Ryland stressed the importance for contractors to "ascertain which payment and adjudication regime applies on any particular project or sub-contract" (Ryland 2011) as many contracts will remain under the old rules for years to come. This is due to the Amendments not having retrospective impact.

The Construction Act outlawed 'pay-when-paid' clauses; the Amendments seek to go further and outlaw 'pay-when-certified' clauses, these make payment to the payee conditional upon the payers receipt of a certificate from its payer (the payers payer, i.e. The client to the main contractor)(Knox 2011, p.5). The Amendments now make any clauses making payment conditional on "a decision by any person as to whether obligations under another contract have been performed" (LDEDCA 2009) unenforceable. Previously the Construction Act only allowed the payer to issue a 'payment notice'; there was no provision for the payee to issue one in default. The amended s110(B) states that in the absence of the payer or specified person issuing a payment notice (compliant to s110A(2)) within five days after the due date, the payee

may issue a default notice (see figure 1) specifying the sum they believe to be due and the basis of calculation (TECBAR 2011, p.4).

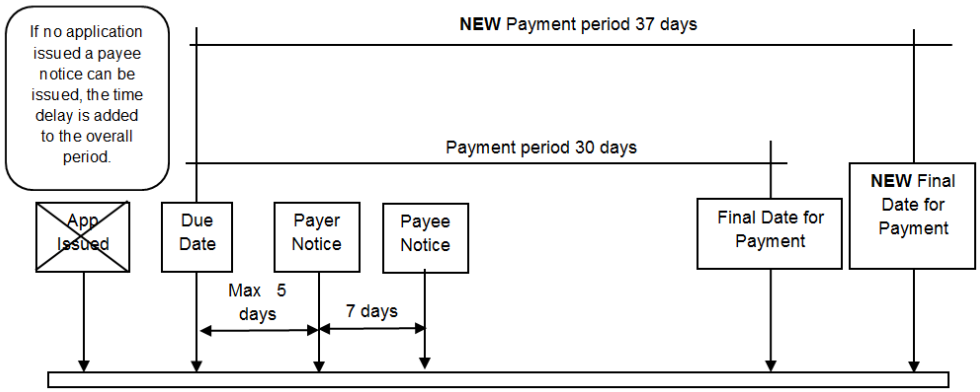


Figure 1, The payee notice extends the payment period adapted from (AIS 2011)

The Amendments also state that if the notice issued by the payee is not acted upon by the payer, the specified sum (on the payees default notice) may become the 'notified sum' (see figure 2) and therefore the payer will be obliged to pay the amount specified by the payee (AIS 2011). Some consider these clauses as "...traps for the unwary payer" (Ryland 2011), Haskwell Kilvington also stressed the amendment was a significant alteration of powers that may cause the payer to pay sums that aren't rightfully due (Haskwell Kilvington 2011).

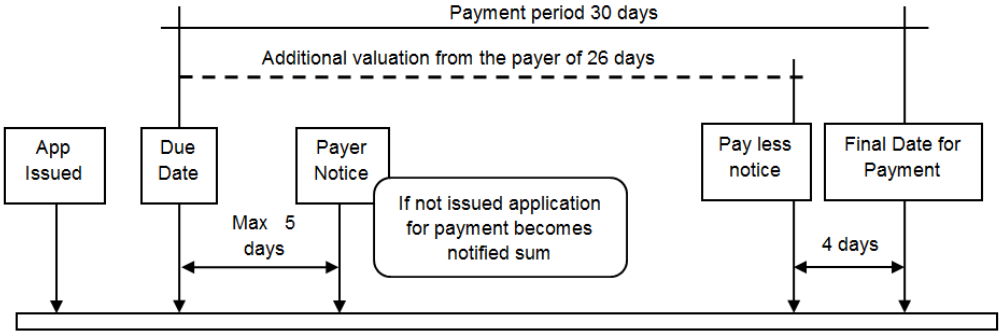


Figure 2, Additional valuation required to issue a pay-less notice adapted from (AIS 2011)

The adversarial positions make it unlikely parties will agree on the sum due. The payer retains the right to pay less than the notified sum by issuing a 'pay-less notice' previously termed a 'withholding notice' (BLM 2011, p.5). The Construction Industry Law Letter (2011) referred to this amendment as a "more stringent method of withholding payment….that requires the payer to explain and justify all deductions, including set-offs and abatements" (CILL 2011). Commercial reality may inhibit this amendment; the 2007 consultation suggests that 90% of payments are not issued with the correct notices (DBERR 2008). Similar to this Jenkinson (2008) found 72% of companies were owed money outside of the agreed payment terms (Jenkinson 2008).

Both of these conclusions are contrary to Burnet's findings of 68% which said that payment procedures were adhered to most of the time (Burnet 2009). Government found during the consultation that 35% of payments aren't paid the sum due (DBERR 2008, p.37).

The Amendments provide clarity for paying an insolvent party and formalised the judgement by Lord Hoffman in Melville Dundas Ltd v George Wimpey UK Ltd (2007) in the House of Lords. The process is dependent upon the date which the payee becomes insolvent, the money owed is better used to offset against damages that may be sought by the employer. The Amendments increase the right for the payee to suspend ‘any or all’ of their works, compared to 'all or none' under the Construction Act. Suspending all work was often seen as abandonment and therefore repudiated the main contract minimising the options to exercise this right (Chappell 2001, p.1). Repudiation of contract is seen to be replicated from Mayhaven Healthcare Limited v Bothma (2009) although upon further investigation the Judge stated "suspension of works under a building contract was not automatically a repudiatory breach of contract" (BAILII 2009). The party in default is now also liable to pay “reasonable amount in respect of costs and expenses reasonably incurred” (CIArb 2010, p.2) and award an extension of time where previously there had been no recourse.

METHODOLOGY

Secondary data, primarily literature, has been used to establish existing opinions and gather information that may support or refute the findings. Online coded questionnaires were administered to establish industry opinions from 72 respondents (see Figure 3), three interviews were conducted to provide a richer vein of data. These three methods were triangulated to establish similarities and contradictions to further validate the conclusions. The vast amount of current literature is testament to the subject and the timely manner of this paper, however the majority of literature is legal guidance used by Solicitors to market their services and consequently were not independent or balanced publications. Pre coded questionnaires were administered via Google Online Documents with the associated link sent out to possible participants by a blind copied email (Bcc). Initial questions obtained broad information used to cross analyse responses to later questions. Data was analysed using various techniques such as Frequency Counts, Normal Distribution, T-test and Chi-Square. Structured interviews were conducted with industry professionals to assist the understanding of the questionnaire responses. If a narrative was required within the interview question this was drawn from the questionnaire responses and literature, here aiming to understand the reasoning for existing trends.

A significant proportion of respondents were legal professionals, but with the increasing legal nature of quantity surveyor and commercial manager roles, the sample remains representative. The low response from Quantity Surveyors, Managers and Directors was disappointing but may reflect the commercial pressures as a result of the economic climate.

Job Title	Frequency	%
Managers	6	8.33%
Quantity Surveyors	5	6.94%
Directors	8	11.11%
Legal Professionals	38	52.78%
Consultants	15	20.83%
Total	72	100.00%
Email Requests Sent	514	
Return Rate	14.01%	

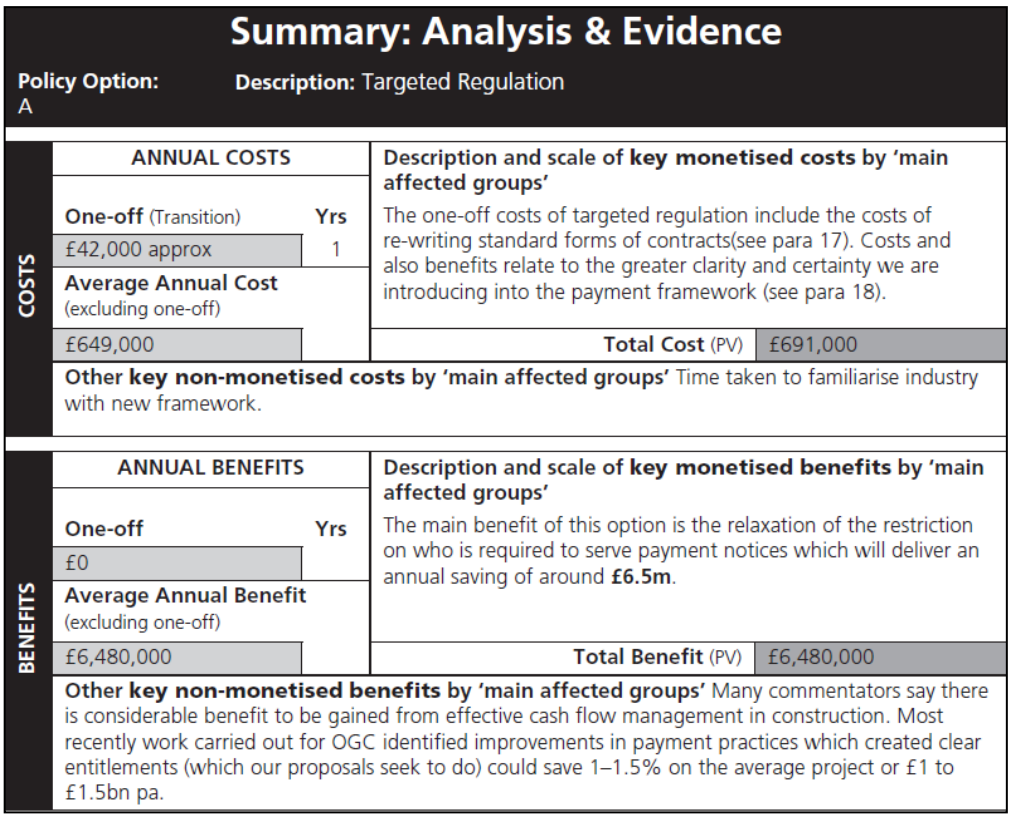
Figure 3, Questionnaire response profile

SUMMARY OF RESULTS AND DISCUSSION

Background and evolution of the Construction Act

Literature shows the Latham Report 1994 influenced the Construction Act which was seen to be significant legislative change to the construction industry. Although the extent to which Latham's 30 recommendations were replicated is unclear, the principal of legislative change remained, stating that endlessly refining contract clauses will not solve the underlying adversarial issues (Latham 1994). Instead Latham proposed a series of basic principles that could "set a statutory baseline for acceptable contractual provisions" (DCLG 2008). Latham also made direct reference to legislation stating "A Construction Contracts Bill should be introduced" (Latham 1994). Literature suggested that the Construction Act was a qualified success for all intended parties (Choat 2010) and had served the industry well (Bingham 2008). Questionnaire respondents supported this view with 83.33% of respondents believing a positive impact. There was no statistical difference found between participants that had and had not personally been involved in the industry prior to the Construction Act. If the Act has had such a positive impact upon the industry was there a requirement to amend it? Literature was quiet on this issue however, Sir Michael Latham stated "generally...[the Construction Act]...is working well but there was room for improvement" (Latham 2004, p.24). The mean response from the questionnaires also supported the need for the Amendments. However they didn't support the sub-contractor lobbying as suggested in the literature [(Bingham 2008) (Choat 2011)], there was no statistical difference between the responses of sub-contractors or main contractors when an 'un-paired t-test' was conducted. The interviewees didn't support the Amendments; all three suggested the Courts were doing an adequate job. All interviewees were legal professionals therefore are likely to follow the complex network of case law. One interviewee did state hesitantly there probably was a requirement to update legislation to include legal precedent. One interviewee also stated that the cost of such legislation is dis-proportionate to the

benefits; this is contradictory to the Government impact assessment. The impact assessment found annual savings in the region of £6,480,000 for just £691,000 (see Figure 4) to implement the Amendments (DCLG 2008).



Summary: Analysis & Evidence

Policy Option: A

Description: Targeted Regulation

COSTS

ANNUAL COSTS		Description and scale of **key monetised costs** by 'main affected groups'
One-off (Transition)	**Yrs**	The one-off costs of targeted regulation include the costs of re-writing standard forms of contracts(see para 17). Costs and also benefits relate to the greater clarity and certainty we are introducing into the payment framework (see para 18).
£42,000 approx	1	
Average Annual Cost (excluding one-off)		
£649,000		**Total Cost** (PV) £691,000

Other key non-monetised costs by 'main affected groups' Time taken to familiarise industry with new framework.

BENEFITS

ANNUAL BENEFITS		Description and scale of **key monetised benefits** by 'main affected groups'
One-off	**Yrs**	The main benefit of this option is the relaxation of the restriction on who is required to serve payment notices which will deliver an annual saving of around **£6.5m**.
£0		
Average Annual Benefit (excluding one-off)		
£6,480,000		**Total Benefit** (PV) £6,480,000

Other key non-monetised benefits by 'main affected groups' Many commentators say there is considerable benefit to be gained from effective cash flow management in construction. Most recently work carried out for OGC identified improvements in payment practices which created clear entitlements (which our proposals seek to do) could save 1–1.5% on the average project or £1 to £1.5bn pa.

Figure 4, DCLG Impact assessment of the Amendments (GB, DCLG 2008)

The Amendments Impact

The 1st October 2011 was important mainly due to the significant changes to standard forms [(AIS 2011; TECBAR 2011; TeCSA 2008]. The Amendments have been discussed extensively within literature, many articles stressing areas of ambiguity. Interviewees were asked about ambiguous drafting and missed opportunities in the Amendments. This resulted in a vast array of issues that in the opinion of the interviewees have not yet been addressed but are critical to the Amendments impact. The main implications were stated within literature as the outlaw of Tolent clauses (s108A) which has been subject to wide scrutiny during the review and drafting process (Forrest 2011). Issues with s108A were reiterated within the interviews stating that the issue had been raised during the review process but the opportunity to rectify was not taken. Literature suggested the outlaw of Tolent clauses was fundamental to the Amendments impact; if deemed enforceable by the Courts such clauses will undermine the efforts to address the dominant position of the payer (Hardwike 2011). The interviewees' frequent reference to Tolent clauses is testament to its importance. Why the drafting is perceived ambiguous and the imminent Court

ruling provides a strong topic to further study. The increased jurisdiction to oral contracts (repeal s107) is widely discussed within literature [(AIS 2011) (Uff 2009) (TECBAR 2011)], this is likely to strain and extend adjudication inhibiting small contractors' cash flows (Gemmell 2010). This was supported by one interviewee who stated s107 will be beneficial to the smaller sub-contractors and who also acknowledged the complications for adjudication. The slip rule as enforced under s108 was seen in literature to cause complications. One interviewee expressed concern that the Amendments do not express the detail prescribed in the Scheme. However further investigation found that the new suites of contract overcome this issue by prescribing the Scheme or expressing the schemes detail in the contract.

The outlawing of pay-when-certified clauses was met with mixed responses in literature, some were in favour and others believed the drafting didn't go far enough leaving a long stop option (Klein 1999). The long-stop option was uncovered during the interviews, with one interviewee directly involved in drafting such a clause that will have the opposite impact on retention further extending the period prior to release. Literature suggests the impact of the rights for the payer to issue a notice in default is likely to be complex. Issues will arise from the reversal of traditional payment roles (Ryland 2011). This amendment was the most frequent response in the questionnaire when participants were asked to identify the most influential part of the Amendments (see Figure 5). This view was supported by the majority of the interviewees, with the amendment redressing the balance toward the payees favour. The clarification on payment to insolvent contractors was seen within the literature to be mere clarity upon existing case law of Melville (AIS 2011). This view was supported by the questionnaires with just 4 of the 72 respondent believing it was the most influential amendment. Interviews confirmed the requirement of the amendment but suggested it would have little impact due to the previously established case law.

The literature was clear in suggesting the Amendments are in favour of the payee. For the same reason the Construction Act set to remove the dominant position of the payer by increasing the payees rights (Latham 1994, p.34). Questionnaires supported this view resulting in a mean response of 'Payee' when asked to rate the Amendments weighting (Figure 5). However upon further analysis, sub-contractors (generally payees) suggested the Amendments were party neutral. A payee weighting was also stated in the interviews, however the ambiguous drafting may be detrimental to this.

These findings display the vast array of ambiguities surrounding the Amendments. The main areas for concern in relation to payment procedures are s110B (payees notice in default) and s112 (rights to suspension), however s112 may be undermined if suspension is viewed as abandonment of contract. The inclusion of oral contracts (repeal of s107) is clearly important and will be beneficial to smaller companies, however this may inhibit the summary adjudication process and s108A (ineffective Tolent clause) will have a large effect on the entire Amendments impact (Figure 6).

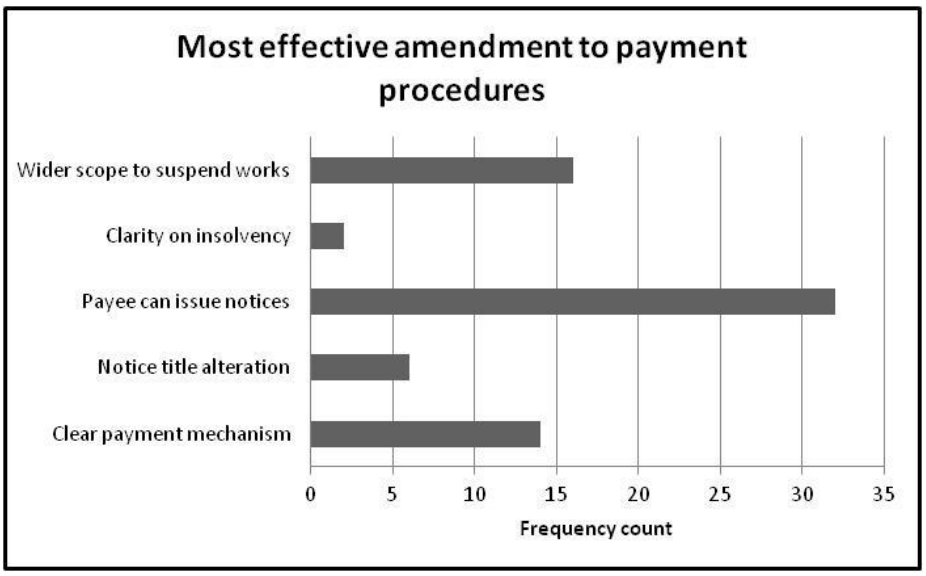


Figure 5: Graphical representation of best amendment

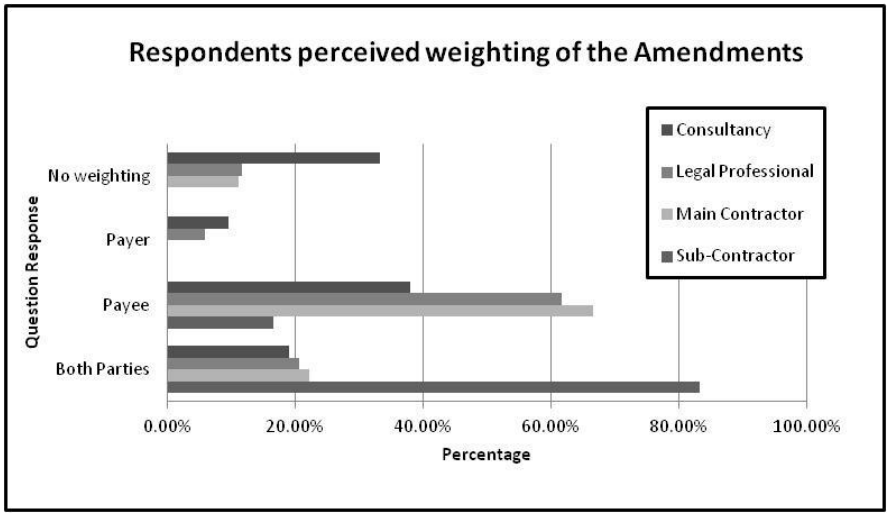


Figure 6: The Amendments perceived weighting

The Amendments Initial Impact

There was little literature suggesting the initial impact of the Amendments. The material impact to redraft contracts was clear with the JCT 2011 and NEC3 suite of contracts written to comply with the Amendments (Haskwell Kilvington 2011). All interviewees noted the amended standard forms and made reference to the re-drafting of paperwork to comply, this aside they had seen little impact post implementation. One interviewee suggested a rush to sign contracts prior to 1st October 2011; this was directly supported by Hayward in Construction Management Magazine (Hayward 2011). Questionnaires found the Amendments have been detrimental to the industry. This was found to be the case at a 5% level of significance when a paired t-test was conducted; this is a result of the ambiguities suggested within the interviews and

literature (AIS 2011). As respondents were mainly legal professionals, a good knowledge of the Construction Act and its amendments is expected. For this reason legal professionals were removed (leaving consultants, sub-contractors and main contractors) resulting in the identification of a more prominent detrimental impact. As a result the industry has sought training on the Amendments. Opinions in relation to training were mixed, in the interviews some believed it was a good sign showing a pro-active response but it was also deemed a large burden to construction companies. Construction companies alone stated no impact. A transitional period was mentioned numerous times by the interviewees but was referred to as adversarial and complex. This suggests why the Amendments have been detrimental to the industry's understanding but would also advocate a 'negative' initial response rather than the no impact found in questionnaires and interviews. The Construction Act was subject to scepticism and a slow implementation in 1998 [Macaulay 1998; Uff 1997]. However the Construction Act turned into the "most important piece of legislation in the construction industry ever" (Bingham 2000, p.2) this research supports a positive impact. The Amendments will take some time for the full impact to prevail, post the transitional period. The industry perceived the long term impact to be beneficial this difference was found to be the case at a level of statistical significance using a paired t-test. This view is supported by literature and Governments intention to intervene in the first place. The majority of interviewees supported the long term benefit after a transitional period. However one interviewee believed there was likely to be little impact at all; this was mainly a result of ambiguous drafting that would undermine the Amendments. Questionnaire data supported a long term positive impact; 63% of respondent believed the Amendments would have a positive impact over time. A paired t-test was conducted and the responses to the initial impact (found to be ‘no impact') were statistically different to the long term impact of 'positive'.

Payment Efficiency

The perceived efficiency of the amended payment procedures is mixed within literature; Government believe the efficiency will be gained by a reduction of duplicate payment notices, as seen in Figure 4, (DCLG 2008). However it is also suggested that the Amendments are likely to create a large burden particularly for small sub-contractors (Horne 2011). Questionnaire responses were mixed displaying a low standard deviation of 1.266. This was investigated further and it was found that the responses varied depending on the respondents organisation type which as a result balanced the opinions to the overall mean of no impact. The results plotted in Figure 7 showed that organisations expressed a bureaucratic view of the Amendments compared to construction companies and consultants who expressed an efficient view towards the new payment processes. Chi-square was used to test the statistical difference of these responses, a calculated x2 value of 8.97 is greater than the table x2 value of 5.99 at two degrees of freedom and a 5% level of significance. Therefore it must be accepted that there is a statistical difference between organisation type and perceived efficiency. No responses were recorded for ‘very efficient’, this is a result of the uncertainty surrounding the Amendments, and therefore the industry is

reserving such complimentary responses. It was also stated within the interviews that parties wishing to withhold or delay the payment process will do what is necessary to avoid it and adjudication will be required to enforce it. Again this reverts back to the problems in relation to adjudication as expressed within the literature and interviews, this uncertainty is inhibiting the full confidence in the Amendments.

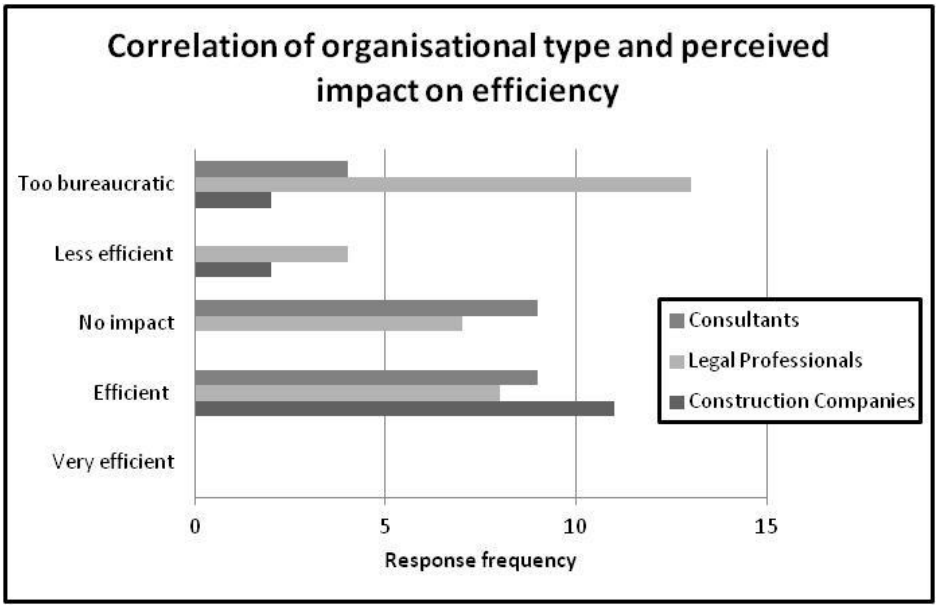


Figure 7, Efficiency of the amended payment procedures

This reserved judgement was also evident when respondents were asked to rate the Amendments on an ordinal scale which returned a mean response of 3.19 suggesting a slight swing towards poor. None of the respondents expressed the Amendments were 'very good' (Figure 8).

The interviewees suggested there would be a transitional period where the industry is currently situated, thus currently experiencing no impact. However after this period all interviewees suggested the Amendments were likely to make payment procedures more efficient. The interviewees long term perceptions combined with the view from questionnaires is reinforced by the statistical difference found between the initial and the long term impact. The interviewees remained hesitant to the efficiency stating that much depended on how the Courts view some of the ambiguities, which must be clarified before the full benefit can be assessed. The large administrative burden suggested by industry publications, contrasted Governments belief that the Amendments would benefit the industry. The findings of this research support Governments view that the Amendments will have a positive impact although this will not prevail until the ambiguities are ironed out. The Amendments and their effect on the efficiency of payment procedures will be influenced by how the Court rules on some of the ambiguous drafting.

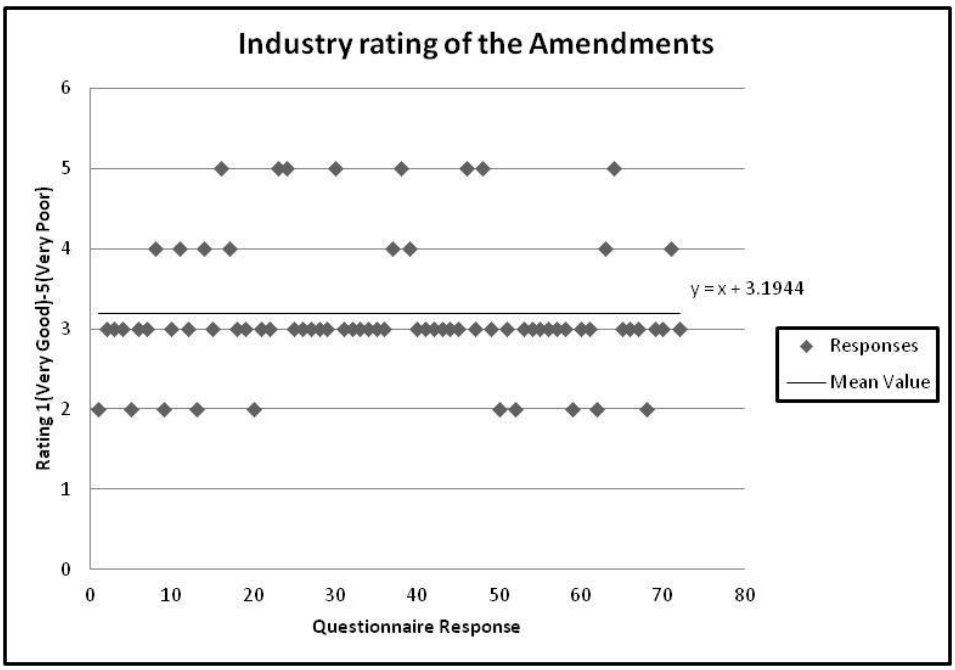


Figure 8, Overall rating of the Amendments

CONCLUSIONS

The Construction Act was a result of the industry's adversarial practices, to redress the payers' dominant position within the supply chain by increasing the rights to the payee. The Latham Report recommended legislative interference; this gave rise to the Construction Act which achieved Royal Assent on 1st May 1998. Initially the industry was sceptical about the new statutory rights and obligations imposed on construction contracts. Since Royal Assent the Construction Act has been viewed as a successful piece of legislation that has had a positive impact on the industry, this was supported by the questionnaire respondents. Industry believed the Amendments were required; this was a generic view with no statistical difference between the sub-contractors and main contractors as literature suggested. The Amendments were aimed at payment procedures with minimal impact on adjudication which was seen to be working adequately. The most influential amendments are the repeal of s107 (governance of oral contracts), s108A (ineffective Tolent clause), s110B (payees notice in default) and s112 (payees rights to suspension). However ambiguities and possible adverse implications surrounding these amendments may undermine their impact. The most influential amendments are weighted in favour of the payee; this is an attempt to redress the balance of the dominant payer. There has been no initial impact on the construction industry, apart from the material re-drafting of contracts and training on the new provisions. The Amendments have been detrimental to the Construction Acts understanding mainly as a result of the ambiguities involved, this is more prominent in construction companies than legal professionals. Despite no initial impact, the findings suggest that over time the Amendments will be beneficial. After the initial transformation period, payment provisions will become more efficient as a

direct result of the Amendments; this view was more prominent within construction companies and consultants than legal professionals. The efficiency will be affected by how the Court rules on the ambiguous clauses, this uncertainty is impacting the industry's views at present, although the intentions are clear the practical implications remain unknown.

This research has found no initial impact therefore the null hypothesis must be retained and the alternative hypothesis rejected. Despite material re-drafting of the standard forms the Amendments have had no effect on the construction industry's payment procedures post implementation. The findings suggest support for the alternative hypothesis that the Amendments will have a positive effect on the industry's payment procedures once the ambiguities have been ironed out. However from the data collected the null hypothesis must be retained.

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AN INVESTIGATION INTO THE FIRE SAFETY MANAGEMENT OF HISTORIC BUILDINGS

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This paper presents the findings of a research project which considered the issues surrounding fire safety management in historic buildings. The main aim was to establish to what extent having a robust fire safety management regime might stand as an alternative to physical measures in achieving a satisfactory level of fire safety. In order to do this, a research method focusing on qualitative methods and aiming to gain an in-depth understanding of the issues was adopted. Secondary data was gathered from a wide range of literature. This was supplemented by interviews with a number of experts in the field of fire safety management and officers of the local fire and rescue service, to gain both a strategic and an operational view of fire service response. The theme was developed with a look at fire safety management in practice: taking three country houses in the local area as case studies. The conclusion arrived at was that, subject to a number of important limitations, such as human fallibility, the findings supported the hypothesis that adopting a robust fire safety management strategy in country houses would allow a reduced level of physical measures to achieve a satisfactory level of fire safety. It was noted, however, that this conclusion was reached with the use of wholly subjective data. It would however, given the subject under consideration, be difficult for this to be otherwise.

Keywords: fire safety, fire safety management, historic buildings

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INTRODUCTION

The primary aim of fire safety is the safeguarding of human life and, in the case of most buildings, the protection of property is a secondary consideration. However, in the context of a historic building ("a building of architectural or historic interest or significance"; Urquhart 2007, p6), protection of the building and its contents has a much higher priority. This is because original historic fabric is often unique and "the loss of any authentic fabric in a fire is irretrievable" (BSI 1998, p9). Thus, fire safety concerns in historic buildings have a dual focus – to protect life and to protect historic fabric.

Fire safety measures are often divided into passive (built into the building structure and fabric) and active (for example a sprinkler system). When considering improving fire safety in an historic building, both are problematic since they often involve physical alterations (also termed physical measures), which could affect the historic character of the building, and it has been suggested that "it is fundamental that we need to find solutions that do not unnecessarily intrude on the historic fabric and value of what we need to protect" (Maxwell and Westerlund Bjurstrom 2007, p1).

Fire safety management has been defined as the application of a disciplined plan to ensure that the risks of and from fire are minimised (Kidd 2010). To what extent fire safety management might be capable of providing the required level of fire safety with a reduced level of alterations, and thus with less effect on the historic character of the building, is a question that would benefit from investigation. Such an investigation was the broad aim of this research project.

According to Mills (2007), the historic building sector is a very large one, there being for example over 370,000 listed buildings in England alone. For the purposes of this study the focus was limited to privately owned country houses with public access. The Oxford Reference Online defines a country house as "a large house in the country, typically the seat of a wealthy or aristocratic family" (Soanes and Stevenson 2008) and this definition was adopted to avoid a potential understanding of the term as meaning simply 'a house in the country'.

LITERATURE REVIEW

Fire in historic buildings

It has been asserted that "fire is still the greatest single threat to our heritage" (Kidd 2003, p1) and that the number, authenticity and quality of European historic buildings is being steadily reduced as a result of fire (Maxwell and Westerlund Bjurstrom 2007).

The gathering of accurate fire statistics for historic buildings, however, is a problematic area, and the exact scale of loss to the built heritage as a result of fire is not fully quantified, though it is known to be significant. As an example, collated data from a variety of sources indicate that in the UK, between January 2002 and June 2006, almost four hundred separate incidents involving fires to historic buildings were

recorded (Mills 2007). This level of loss is considered to be unacceptable (Maxwell and Westerlund Bjurstrom 2007).

There have been a number of significant fires in historic buildings and these have been well documented. The importance of these is in the lessons that have been learnt from them and the ideas, particularly those relating to fire safety management, that have been developed as a result. Following the Windsor Palace fire a report was commissioned and published as Fire Protection Measures for the Royal Palaces (Bailey et al. 1993). This contained a series of recommendations for fire safety in Royal Palaces. The conclusions were summarised by Kidd (1995) and subsequently developed as a comprehensive list of requirements for the management of fire safety in all historic buildings (see Figure 1).

LEGISLATION AND GUIDANCE

The primary article of legislation relating to fire safety is the Regulatory Reform (Fire Safety) Order 2005 (HM Government 2005), hereinafter referred to as the Fire Safety Order, which from October 2006 became the overriding fire safety legislation for existing non-domestic buildings in England and Wales. This was introduced "to simplify the regulations and their enforcement with a single risk-based piece of legislation" (Emery 2010, p33) and places the responsibility for fire safety with a 'responsible person' who is required to take certain specified general fire precautions. The 'responsible person' might be in differing circumstances an employer; a person who has control of the premises or the owner.

The responsible person is also required to "make a suitable and sufficient assessment of the risks to which relevant persons are exposed for the purpose of identifying the general fire precautions he needs to take to comply" (HM Government 2005, p9) For this purpose a Fire Safety Risk Assessment (FRA) must be carried out. If five or more people are employed on the premises, or if the premises are licensed, any significant findings of the FRA must be recorded (DCLG 2006).

Barker (2010) has suggested that for historic buildings it is crucially important that a well structured and properly implemented fire safety management plan accompanies the FRA.

Guidance and advice is offered by the Department for Communities and Local Government (DCLG) for various uses of premises, via a series of guides in the 'Fire Safety Risk Assessment' series, which contain an appendix about Historic Buildings. A key issue raised is the need to "endeavour to strike a balance between ensuring sufficient fire safety measures are in place for the safety of people, yet avoid extensive alterations and helping to maintain the character of the building" (DCLG 2006, p125). This dichotomy, between fire safety (for both people; and the building and contents) on the one hand and maintaining character on the other, is at the heart of fire safety issues in heritage buildings.

- Each building or institution must have a fire safety policy.
- The institution should appoint a fire safety manager.
- In larger premises, the FSM should be assisted by a full or part-time Fire Safety Officer.
- A fire risk assessment should be undertaken and updated regularly.
- A fire safety manual and a record book should be set up and maintained.
- Automatic fire detection systems of modern design and capability should be introduced.
- Following a full survey, the fire resisting elements of the building should be upgraded.
- Where particular legal requirements exist these must be complied with.
- All staff, including part-timers and volunteers must be trained in all aspects of their role in fire safety.
- Where individual residences or apartments form part of a heritage building, these must form part of the general survey and risk assessment.
- Special, detailed arrangements must be imposed to control and supervise all contractors.
- Special care must be taken when arranging or hosting special events, especially if these involve filming, fireworks or fashion. The Risk Assessment will have to be repeated, taking into account the new risks and hazards.
- In larger premises a trained damage limitation team should be set up.
- Regular liaison meetings and exercises with the local fire brigade should take place.
- Consideration should be given to the benefits of sprinkler systems, particularly if compartmentation and segregation of the building proves difficult or costly.
- A full set of records, drawings, photographs and other information should be stored off-site for use in rebuilding in the event of a fire.

Figure 1 Managing Fire Safety in Historic Buildings (Kidd 2008b)

CONSERVATION GUIDANCE AND PRACTICAL CONSIDERATIONS

The rationale for conserving historic buildings is set out succinctly in BS7913:1998, (Guide to the principles of the conservation of historic buildings): "An understanding of contemporary society as a basis for contemplating the future depends to a significant extent on knowledge of the past" (BSI 1998, p4). In addition to this, historic buildings may be of economic value (particularly to the tourist industry) and

have an impact on the attractiveness and identity of a community (Maxwell and Westerlund Bjurstrom 2007).

BS7913:1998 presents useful criteria for alteration work, which might be kept in mind whilst contemplating potentially 'extensive alterations' for fire protection. Perhaps the key parts of the advice are the following:

- "Disturbance of significant existing fabric should be avoided".
- "The level of intervention should be the lowest appropriate level, and this should be capable of being substantiated".
- "Some buildings or parts of buildings are of such quality, importance or completeness that they should not be altered at all except in the most exceptional circumstances".
- "Consideration should always be given to the desirability of carrying out alterations in such a way that they could be reversed quite easily; that is, that new work could be removed and the building reinstated to its previous state without further significant damage to the pre-existing fabric".

(BSI 1998, p12)

Forrest (1996) has suggested that developing a strategic approach to fire safety measures can lead to the adoption of more sympathetic solutions. Perhaps then, careful consideration of a suitable management strategy might allow an acceptable level of fire safety without, or with a reduced level of, intrusive alterations. Such a strategy would rely "on a strong management plan to minimise the risk of a fire occurring" (Betts 2009, p37) and ensure that if it did occur it might be discovered quickly and contained effectively.

However, such a strategy will only go so far and, juxtaposed to it in the context of this study, is the fact that many country houses are in locations where, should a fire occur, the fire and rescue service response might be slow and inadequate at first (for example where retained fire personnel are used; the house is some distance from the nearest fire station, where only a small tender is available). Limited water supply might present another problem. It has been estimated that in around 30% of historic building fires in rural areas a shortage of water is a major factor (Kidd 2008).

Given the above, in addition to other factors relevant in historic buildings (such as combustibility of materials; hidden voids and so on), Stewart Kidd has noted that "In virtually all historic buildings unless a fire is extinguished in the first two or three minutes by staff, it will burn until all combustible materials are destroyed" (Kidd 2008, p123). Thus, an important point to be considered is the possible provision of an automatic fire suppression system. Should a fire occur, such a system is likely to both limit fire damage and, importantly, water damage. Research has been carried out as to how automatic fire suppression might be sympathetically integrated into historic buildings.

THE EXPERT OPINION

Management as an alternative to physical fire protection

One of the aims of this project was to attempt to assess the extent to which having a robust fire safety management strategy in a historic building might reduce the need for physical fire protection measures in the building. Since there has been little written on this point, the opinions of experts in the field of fire safety in general, and with the historic building sector in particular, was considered important and a series of interviews were conducted to canvas this opinion.

There was broad agreement that good fire safety management is a crucial part of overall fire safety and that it might, to a large extent, reduce the need for physical fire protection measures by reducing the fire risk. However, a number of important points were brought up and some limitations were expressed.

Human fallibility emerged as a recurrent theme during the interviews and was considered to be a stumbling block where an approach is adopted that relies on management measures rather than physical measures. It was pointed out that people demonstrate every day that they can't be trusted with managing fire safety (Baker 2012a, pers. comm.).

The suggestion was made that a high level of management might obviate the need to do anything (Emery 2012, pers. comm.), and the example was given of some National Trust properties where there is a steward present in every room while the house is open. This might mean that there is no need to have, for example, exit signs or automatic door closers (the steward doing the work of both), and ultimately all the physical measures that would normally be incorporated into a country house (ibid).

However, there are two important points:

- Firstly the means of escape would still need to be considered: travel distances; other rooms that would need to be navigated on the exit route and exit capacities from rooms, would all need to be checked and might dictate that other measures are required (Emery 2012, pers. comm.).
- Secondly, and importantly, automatic fire detection would be required, in the majority of cases, in any historic building. In terms of a hierarchy of importance, automatic fire detection is considered to be most the important (Emery 2012, pers. comm.; Kidd 2012, pers. comm.), followed by management of the whole fire safety regime.

Additionally, there is a major limitation placed on this approach due to there being a high turnover of staff within the National Trust and, in reality, this could lead to a reduction in the level of staff experience with buildings and with fire safety matters (Kidd 2012, pers. comm.). Compounding this problem is the fact that, in the case of the National Trust there may be as few as two fire safety specialists dealing with around 300 buildings and, as a result, inspections and reviews can be relatively

infrequent (Kidd 2012, pers. comm.). This is a potentially dangerous scenario, one where remote senior management may believe that risks have been reduced to a low level and a parallel policy of reduction in physical measures has been adopted; whereas, in reality, the risk might be higher than thought. This brings us back to the second point: that automatic fire detection is a vital first tier.

In a broader context, and of particular relevance for the case studies considered in this study, for a privately owned and operated country house, the implementation of a robust management strategy might depend on the owner being on site at all times (Parker 2012, pers. comm.). In reality this is very difficult to achieve and, as with the National Trust example, the emphasis is likely to be placed on (theoretically) well trained and committed staff.

In terms of physical measures required, an important point is that the threshold between the need for no intervention to the fabric of the building and the need for intervention, needs to be building-specific and cannot be generic (Emery 2012, pers. comm.). In other words, each building needs to be risk-assessed with regard to fire and an individual decision made for each building. The risk assessment will disclose what the hazards are (if any), how the hazards have been managed and reduced, and what residual risks remain (Kidd 2012, pers. comm.). Overall, it is vital that the risk is both understood and managed (Parker 2012, pers. comm.).

If, beyond the installation of fire detection and alarm, there is a residual risk which requires physical intervention, then there is the choice between passive measures, for example by introducing compartmentation, and active measures, for example a sprinkler or water mist system (Kidd 2012, pers. comm.). In some cases both active and passive measures have been introduced, for example at Chatsworth House in Derbyshire (Grade I listed), where a partial sprinkler system has been installed and physical compartmentation has been created by the introduction of new doors and panels to divide long corridors (Sewell 2012, pers. comm.).

Another aspect of the management question considered was the extent to which fire risk could be managed down to as low a level as possible. It was felt by all that although risk could in theory be reduced to zero, in practice any building in use would retain some, albeit potentially low, residual risk.

THE CONSERVATION ASPECT

As has been noted already, the need to strike a balance between fire safety and historic character is at the heart of any matters relating to potential fire safety improvements which might require the adoption of physical measures.

In terms of physical measures introduced to improve fire safety, it was stressed that general conservation principles apply (Emery 2012, Kidd 2012, Sewell 2012: pers. comm.), and in particular minimal intervention and reversibility. The point was also made that the reason for the importance of a building, or of a feature, needs to be identified to put into context the effect of any potential alterations (Emery 2012, Sewell 2012: pers. comm.). Thus, for example, the introduction of sprinkler heads in

ceilings might be acceptable in a building that is important because of its overall character or historic importance, but not in a building whose ceilings are an important part of the historic fabric (Emery 2012 pers. comm.). It was also pointed out that concealed sprinkler heads are almost invisible in a ceiling and can be finished to match the surface finish of the ceiling (Kidd 2012, pers. comm.).

It should be noted that the need to make alterations to satisfy fire safety requirements are unlikely to be required unless some change is taking place to the building, either in terms of physical alterations or of use. In a situation where some form of consent is required, and if the building is listed all alterations require at least listed building consent, there is potentially a reasonable degree of flexibility where physical measures are required for fire safety. However, this reduces with the importance of a building and a Grade I listing could potentially preclude any physical alterations (Sewell 2012 pers. comm.).

FIRE SUPPRESSION SYSTEMS

Although automatic fire suppression systems have been identified as being of benefit in the context of historic buildings, the reality is that they are unlikely to be practical solution for the private owner of the average country house because of cost (Coull 2012, Emery 2012, Kidd 2012: pers. comm.). It was also pointed out that a sufficiently good system of managing the risk would be far cheaper (Baker 2012b, pers. comm.).

Should a system be able to be considered, installation would be best achieved whilst other work is being carried out (Coull 2012, Kidd 2012: pers. comm.), otherwise the installation costs would be disproportionately high. However, potential damage to historic fabric whilst installing pipework remains an issue (Emery 2012, pers. comm.). There is also the concern of leaks in the system causing damage to historic fabric (ibid).

It was also suggested that if there is the need to comply with legislation, then a fire suppression system might be more cost effective than the alternative ways of providing, for example, protected or alternative means of escape (Kidd 2012, pers. comm.).

FIRE AND RESCUE SERVICE ISSUES

The local fire and rescue service whose area covers all three properties considered as case studies is Derbyshire Fire and Rescue Service (hereafter referred to as DFRS), and interviews were carried out, both at strategic and operational levels, to gain their perspective on fire fighting in historic buildings.

Geographically, all the case studies are in areas that are classified as ‘remote rural’ by DFRS. These areas overall are considered low risk, especially in comparison to a city area, where both high population density and demographic indicators suggest a greater risk of fire and for potential spread of fire (Wells 2012a, pers. comm.).

Consequently, fire stations are smaller, with fewer pumps available and a lower level of crewing (often with a retained duty crew).

DFRS aims to be on scene at 95% of fires with one appliance within 10 minutes of the fire call; with a second appliance within 13 minutes in 85% of cases (Wells 2012 pers. comm.). However, the reality for a rural location, such as for the three case study properties, is that response times might potentially be longer. Factors such as crew availability at the nearest fire station; other current demands on resources; and even such diverse factors as summer tourist traffic on the roads may increase response times considerably (Doherty 2012, pers. comm.).

The implication of a potentially long response time is that a country house in a rural location cannot afford to rely on an early fire and rescue service presence at a fire incident. This can be seen to be the case in Derbyshire, but given that each regional fire and rescue service has similarly finite and limited resources, it is almost certainly the case nationwide. In fact, in some sparsely populated counties, response times might be even longer. To some extent therefore, country houses should perhaps seek to be self-sufficient and not simply rely on the fire and rescue service.

CASE STUDIES

Three case studies were carried out, all within the boundaries of the Peak District National Park in Derbyshire. These were at Haddon Hall, Hassop Hall and Tissington Hall. They were chosen because of their relative equivalence in size, but proved to be very different when investigated in detail.

Hassop Hall stands out because it contains hotel sleeping accommodation, and a higher level of fire safety vigilance on the part of the authorities (to ensure compliance with legislation) would be expected as a result. This is in fact the case, and, as a result, the level of fire safety appears to be in a process of continual improvement. In terms of fire safety management, to some extent Hassop's approach is reactive – acting on advice from the fire safety officer.

There is a greater reliance on physical measures at Hassop than in the other properties. Notwithstanding the Grade II* listing, the introduction of these appears to be perhaps more accepted in the context of a hotel and the increased risk associated with sleeping accommodation. This may also be related in part to the relative lack of valuable fabric internally.

Haddon Hall and Tissington Hall, although physically very different buildings, are very similar in some aspects. In both properties there are sections of the building covered by the Fire Safety Order, conjoined with sections that are outside of any legislative requirements. In both cases there is limited fire separation between the two sections.

In both buildings there is the possibility that a fire starting in the private apartments could spread into the section where the main heritage value is located (this being the section to which the public has access). Fire could also spread in the other direction of course. In both buildings, despite lack of legislative requirements, within the private

section there is at least fire detection and alarm, and alternative exits are available, both of which protect life safety in the private sleeping accommodation. Improvements to fire separation (as allowed within conservation constraints), particularly through the upgrading of doorsets, would be worthwhile in both buildings.

There is, however, a fundamental difference between the two properties and this relates to fire safety management. That at Haddon is extensive and well organised; that at Tissington is partial and has not been fully considered. Thus, in the event of a fire, it would appear that Haddon is much better organised and equipped to react.

It was noted for Haddon, for example, that, in a fire situation, fire and rescue service response would be likely to be effective, since all the aspects have been planned for and rehearsed. The situation at Tissington leaves far more to chance, and there is a strong possibility that there might be a delay in getting water onto a fire.

The question has to be asked as to why this fundamental difference in fire safety management exists. Three reasons suggest themselves:

1. Resources: Haddon is a bigger commercial operation and employs full-time staff, who are tasked with fire safety management; Sir Richard FitzHerbert operates with little outside help and has less time and resources to put into fire safety;
2. Chance: A previous land agent who looked after Haddon was an ex-fire safety officer and introduced such things as regular staff training, a fire plan and a salvage plan;
3. Fire and rescue service operational risk classification: Haddon is classed as high risk; Tissington is classed as low risk. In theory this means that the fire and rescue service is more engaged with Haddon; in reality it probably has just as much to do with Haddon's pro-active approach. It does mean however, that the level of information (in the form of an Operational Incident Plan) held about Haddon is higher.

Both establishments have to satisfy similar legislative requirements, however the differences in the apparent effectiveness of the fire safety regime between the two would perhaps suggests that, where no changes are being carried out, legislation does not in practice determine the overall level of fire safety, particularly where fire safety management plays a significant part in this. From another angle, it might be suggested that the legislation is not actually effective. However, since life safety is the main thrust of the legislation, it could be argued that the legislation is effective where it is intended to be (for example protecting sleeping accommodation at Hassop Hall).

DISCUSSION

The idea that fire safety management in historic buildings might allow a reduced level of physical alterations (to accommodate physical fire safety measures) was identified during a review of the literature. This idea was pursued, and was confirmed, with limitations, by a number of experts in fire safety management in historic buildings.

A brief inquiry into the situation regarding fire and rescue service response revealed that, although reasonable response times to a fire call are theoretically possible, in reality retained duty crews in the closest stations might not be available (either not up to strength or busy elsewhere) and the response times considerably increased. A pragmatic conclusion from this is that historic buildings, particularly in rural areas such as the country houses which are the focus of this dissertation, should not necessarily rely on assistance from outside arriving in time to gain early control of a fire.

The onus then is on self-reliance for dealing with the initial stages of a fire. The first and most fundamental requirement is for effective automatic detection and alarm. Without this early warning, there is a good chance that any fire will have a chance to develop beyond the point of control before it is discovered. Automatic detection and alarm forms part of any fire safety management regime since it needs to be planned (if not already installed) and requires regular maintenance.

It can be argued that historic buildings should, within the constraints of affordability and sympathetic and reversible interventions, have the highest level of physical protection measures available in order to ensure maximum protection to irreplaceable heritage.

In terms of passive measures, it may be possible to achieve limited improvements in fire separation by improving the fire resistance of existing fabric. Recent improvements in intumescent finishes may offer a more widely applicable option in this respect. More intrusive interventions, such as the wholesale replacement of doorsets may simply not be possible.

Considering active measures, automatic fire suppression systems, the most appropriate of which for use in a historic building being water mist systems, have obvious and substantial benefits. They have the potential to either extinguish a fire or, at least, prevent it from developing. However, there are two big drawbacks of relevance. The first is that they may be prohibitively expensive in the context of most privately owned country houses. The question of automatic fire suppression was fully discussed during the case studies, and in all cases such a system would be a financial impossibility. The likelihood is that automatic suppression systems will only be considered for the very best historic buildings (in terms of rarity and cultural value) and most of these are likely to be in public ownership, where affordability may be less of an issue.

Secondly, the installation of a system in a historic building is problematic. The ideal is to have the system hidden from view and this is perfectly possible with narrow diameter pipework and concealed heads. However, installation could involve considerable disturbance to historic fabric and might be prohibitive.

So, the reality for most country houses is likely to be that fire safety management is actually very important in delivering an acceptable level of fire safety, by reducing the risk of a fire occurring and by limiting its development and spread. A fundamental starting point for this is a building-specific fire safety risk assessment, followed by the

development of a comprehensive fire safety management plan. Human fallibility is a factor that must be taken into account in the development of this plan.

In terms of the quality of practical, day-to-day management of fire safety, a privately owned country house might perhaps be in a better position than a publicly owned country house. Fundamentally, a fire safety strategy that puts emphasis on managed solutions depends on the staff and managers for effective implementation. As was noted with the National Trust example, high staff turnover may be a problem, and members of staff that don't remain in post for long are less likely to be experienced and committed. In contrast, for a building such as Haddon Hall, which has very low staff turnover and committed and loyal staff members, in combination with regular training and review, the implementation of the management strategy appears to be very effective. This is particularly of concern where the listing status of a building, and the consequent limitations imposed on physical alterations, is likely to put a higher emphasis on managed solutions.

For some privately owned country houses the issue of limited resources may limit the level of fire safety management that can be achieved.

CONCLUSION

The hypothesis questioned whether adopting a robust fire safety management strategy in country houses will allow a reduced level of physical measures to achieve a satisfactory level of fire safety. Based upon the opinions expressed by experts in the field, and on the case study of Haddon Hall in particular, it can be tentatively concluded that is indeed the case. If we consider the case of Tissington Hall, it might be suggested that the current situation is not ideal and argued that there is room for improvement. If a more proactive fire safety management strategy were adopted, and, for example, a comprehensive fire plan drawn up and efforts made to engage with the fire and rescue service, then a more satisfactory level of fire safety might be achieved.

It should be stressed that this conclusion has been reached with the use of wholly subjective data. It would be extremely difficult, however, for this not to be the case. All historic buildings are different in their physical make-up and contents; physical fire protection measures vary widely and fires are also very varied. To be able to compare therefore a similar fire, in a similar building, with similar existing protection measures; with and without a robust fire safety management strategy is impossible.

It is ironic that buildings which perhaps have the greatest need of fire protection measures, in order to protect valuable heritage, are least able to support them from a conservation viewpoint. However, if we accept that the adoption of a robust fire safety management strategy will indeed allow a reduced level of physical measures then this dichotomy is to some extent resolved. Further study into management measures in historic buildings, to prevent fires occurring and dealing with a fire should one occur, would enable the tentative conclusion reached here to be confirmed (or otherwise).

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RECESSIONARY INFLUENCES UPON SURVEYING FIRMS WITHIN UK CONSTRUCTION: A COMPARISON OF LARGE AND SMALL FIRMS

Bethan Lewis [3]

Bethan Lewis graduated with a 1st class honours in Building Surveying and won the PSK Prout Tilbrook Award for the most original dissertation. She also won the Michael Heller Prize for the female student with highest final year mark within the Built Environment. She is now working as a Graduate Building Surveyor at Faithful and Gould.

The 2008 UK recession had a large impact upon the construction industry and therefore a knock-on effect on the surveying profession. This study aims to establish the impact of the recession upon general practice and building surveying firms within the UK and the methods of adaptability that they have used in order to survive the recession. Primary data was collected via interviews and case studies which focused on the methods of survival implemented by large and small firms. Comparing and analysing primary and secondary data it has been established that there is a clear distinction between the strategies employed by small and large firms. The large firms within this study used an ambidextrous approach that involved redundancies as a retrenchment method, followed by an investment strategy to increase services offered and to raise firm profile. The small firms in the study mainly focused on retrenchment, through cutting costs and making redundancies. Although marketing was seen to be important by the small firms, few had actively increased their marketing strategy, and other methods of investment had rarely been considered. Taking into account the difference in strategies currently used, this report has proposed two survival strategy models. The models provide a two phase strategy to promote a strong market position which was found to be key in making a full recovery following a recession.

Key Words: Construction, Recession, Strategy, Surveying

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INTRODUCTION

This study intends to look at the effect of the recession on UK surveying firms and the strategies that they have employed in order to survive.

The rationale for this research is to understand the effects on firms and how they are coping with said effects, which will enable the industry to become more resilient in the current climate and in the future.

The recent UK recession has seen household incomes fall by 1.6% over the last three years (BBC News, 2011). Economic effects have been felt in the construction industry with works in progress falling by 3,253 between 2008 and 2009 (Office for National Statistics, 2011a). These effects in turn impact upon surveying firms.

This study has used secondary research in the form of reports, texts and journal articles and also collected primary research through case studies and interviews to determine the effect of the recession on a number of small and large surveying firms within the UK.

The information from the primary interviews and case studies has been used to compare the different strategies employed by those companies in order to survive the economic downturn.

National data has been triangulated in conjunction with firm specific data in order to validate findings and compare the impacts on both large and small firms.

RESEARCH METHODOLOGY

This study used both primary and secondary data in order triangulate findings from primary research to validate the findings of the study. Sources of secondary research used within this study were books, journals, web sites and official documents. Primary data was collected through interviews. Case studies were compiled using both primary interview data and secondary resources published by those companies interviewed.

Both qualitative and quantitative data was used within the study to provide reliability to findings. Quantitative data is that which is based upon figures, the mathematical analysis of those figures and therefore is generally objective (Creswell, 1994). Bryman and Bell (2011) state the main distinction between quantitative and qualitative data as being the employment of ‘measurement’ of quantitative data. Examples of quantitative data that were used in this study are data from national statistics and national surveys.

Qualitative data is based on opinion and perception, it is subjective by its very nature and is said to be less analytical than quantitative data as the research cannot be mathematically tested (Holt, 1998). The advantage said to be held by qualitative data is that it can be a true reflection of reality at that moment in time (Bryman & Bell, 2011). The types of qualitative data that were used in this study are interviews and case studies that are rich in information, albeit from a limited source. The selection of data type for this study is of utmost importance in order to produce the most reliable

outcome. However the importance of being true to the research question should take priority over the amount and type of data available (Newman & Benz, 1998).

The methodical process employed in this study determined that quota sampling was used to select a fair representation of participants. Qualitative data was felt to be most appropriate in order to gain the thoughts and feelings of the participants and semi-structured interviews allowed the Author to probe when a participant raised an important issue that was not covered by the original question set. Thematic analysis has allowed themes and hierarchies to be formed through issues that were highlighted during the literature review. These codes were then expanded using axial coding.

Axial coding allowed the themes to evolve throughout the research process in order to gather the widest possible data range. Additional questions were added to the data collection process that were based upon the Author's personal perception of additional strategies that have not already been reported upon and also areas of interest for the study.

LITERATURE REVIEW

The key areas of the Literature review have been highlighted here; these findings formed the basis of the question set that was utilised in the participant interviews.

Historic Recession Behaviour and its effect on Construction Output

In order to create an adaptive strategy to a recession firstly we must understand the mechanisms of a recession and its cyclical behaviour. The word recession is defined by the Oxford English Dictionary as:

"a period of temporary economic decline during which trade and industrial activity are reduced."

However, in an economical sense a recession is indicated by the reduction in a country's GDP (Gross Domestic Product) for two consecutive quarters or more (Business Dictionary 2012). Table 1 demonstrates the previous major recessions in the UK from 1919 to 2009.

Years	Duration	Total GDP -	Years between	Comments
1919 – 1921	3 years	-27	-	The end of World War I saw high numbers of unemployment, poorly planned fiscal policy and a reduction in UK exports leading to the 1919 recession.
1930 – 1932	2 years	-15.4	9	The US depression lead to a decrease in UK exports and in turn lead to recession.
1973 – 1975	3 years	-5.5	41	The prolonged duration between major recessions was a result of the post war boom, where employment rose and inflation was moderately low. The 1973 recession was sparked by an oil crisis, known as OPEC I.
1979 – 1982	3 years	-4.1	4	The 1979 recession was once again caused by an oil crisis, known as OPEC II. It was also fuelled by rising inflation, increased export values and a change in the exchange rate.
1989 – 1993	4 years	-12.4	7	'Financial Deregulation' was seen as a reason for rapid unsustainable expansion which created debt both in business and at a personal level. Leading to the recession in the early 90's.
2008 – 2009	2 years	-7.4	15	The most recent recession has been said to have been caused by the collapse of the Financial sector through buying 'bad debt' that was packaged with 'good debt' in American trading.

Table 1 – UK Major Recession History 1919-2009Source: (Dow 1998;(Evans, Rogers and Sedghi 2011)

Table 1 demonstrates that UK recessions historically last between two and four years, with anything from four to forty-one years interval between them. This makes predicting recessions difficult, but if the post war recessions are isolated it can be seen that there were four and seven years between the recessions of the 1970's, 1980's and 1990's. As it has been identified that the current recession followed fifteen years after the 1990's recession it can be understood that because the UK went into recession 'later' than previous time cycles that the recession would in fact last longer than the average of three years.

Technically the current recession ended in the latter quarters of 2009 with three consecutive quarters where the GDP rose. However, with the uncertainty of the Euro-zone and further economic decline in America there have been several quarters where UK GDP has fallen and looked as though the economy would experience a 'double dip' recession (The Construction Index, 2012). A 'double dip' recession is where the economy falls into recession twice in quick succession with only a brief period of recovery between (Scott, 2003).

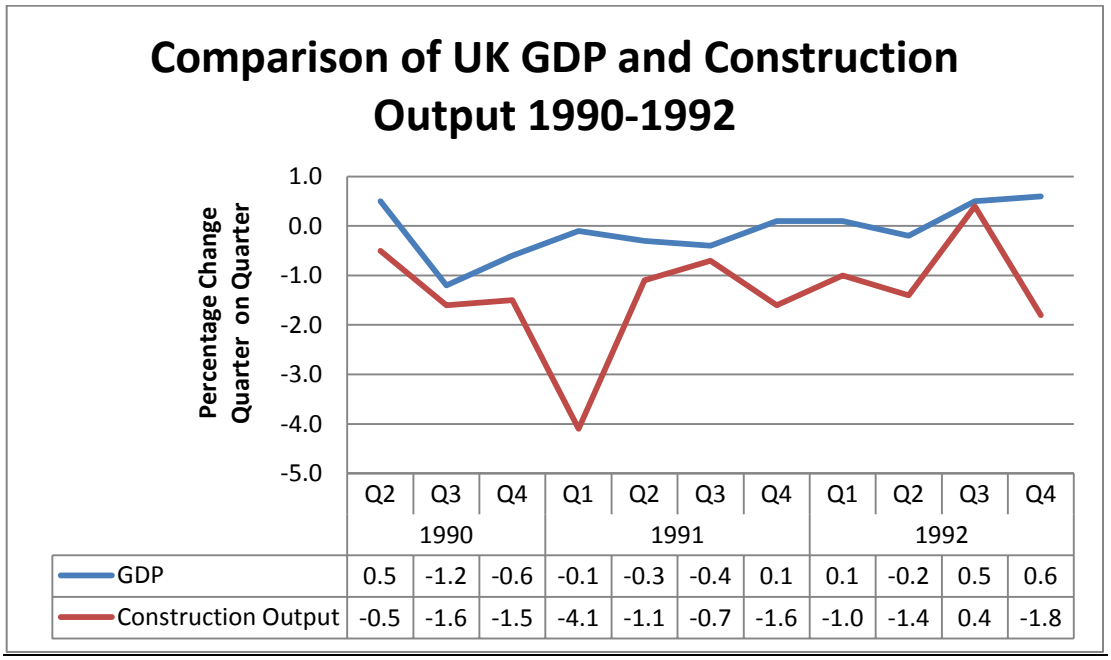
This uncertainty in the economy and fluctuating GDP has lead to a nervousness that is preventing spending and investments alike. The current recovery is said to be the slowest since the recession in 1832, which demonstrates the weakness of the markets, not just within the UK but Worldwide (Cohen & Jones, 2012).

Between Q1 2008 and Q2 2009 the UK GDP fell by a total of 7.4% (Kern, 2010) which resulted in 170,000 redundancies within the construction industry between August 2008 and August 2009 (Green, 2009). Green also stated that over that year registered construction related job vacancies had fallen from 25,000 to 9,000, which verifies the impact that the recession was having on the construction industry.

At the beginning of 2010 many economists felt that the market condition would pick up and begin to rise again. Indeed, between 2010 and 2011 the UK had seen its GDP rise by 2.7% on aggregate (Evans, Rogers, & Sedghi, 2011). However between Q3 in 2010 and Q3 in 2011 the total output of new work in the construction industry fell by 1.8% (Office for National Statistics, 2011b) and is predicted to fall by a further 3.6% in 2012 (Richardson, 2011), demonstrating the need for this research.

Large numbers of unemployed are also reducing spending within the UK economy. In November 2011 unemployment figures rose to 2.62 million people, the highest level of unemployment in the UK in seventeen years; reinforcing that the effects of the recession are still very apparent and with little sign of recovery in sight (Allen, 2011).

Graph 1 demonstrates the relationship between the GDP and the construction output for the 1990-1992 recession.



Graph 1 – Comparison of UK GDP and Construction Output 1990-1992 (modified after Evans, Rogers and Sedghi, 2011 and Office for National Statistics 2011c)

Graphs plotted for the last four major recessions demonstrates the cyclical behaviour of recessions and that when the UK enters recession the construction industry will be greatly impacted. Graph 1 shows that even after the GDP begins to increase, showing signs of economic recovery, construction output is still in decline, this was common for several historic recessions. This demonstrates that the construction output generally takes longer to recover and stabilise post recession.

ADAPTABILITY

This section aims to identify current adaptation methods that are employed by firms in order to survive during a recession. Adaptability strategies can be broken down into two main types, retrenchment and investment. Retrenchment is the cutting of costs through reduction in services, staff, overheads and fixed costs. Whereas investment involves investment into a new product, service or process that competitors do not currently offer. These strategies are also sometimes combined to create an "ambidextrous" approach (Kitching, Business strategies and performance during dificult economic conditions, 2009).

There have been several studies that have investigated the methods of adaptation that firms have employed over the last four years (period of 2008-2012). Looking at these reports and industry related articles the Author has identified several strategies that are currently being employed within the UK.

In a report published by the Construction Industry Council (CIC) in 2010 they conducted a survey with 500 quantity surveying based SMEs. The report stated that 46% of the firms interviewed were making redundancies. This is supported by a

study conducted by Lowth et al (2010) that found that the majority of the companies they questioned were applying a retrenchment strategy, including reducing staff numbers.

A report by The Sector Skills Council (2009) expresses that as the demand for lettings rose above that for bought properties, agents had to adapt in order to incorporate and expand the letting side of the business. The decrease in demand for agency services saw almost 32,000 estate agents being made redundant between 2008 and 2009 (Wollop, 2008). This vast number of redundancies mirrors the impact of the recession on surveying professionals as well as the general UK economy.

The CIC (2010) report also stated that 16% of the participants were employing personnel with a different skill set in order to widen the range of services that they were able to offer. The report also found that 22% of the firms interviewed had increased expenditure on training for the same purpose. This type of strategy is an investment approach. In a report investigating SME responses during and post recession it was found that the majority of SMEs initially applied the retrenchment method during the recession and then applied an investment approach post-recession (Kitching, Adapting to fragile recovery: SME responses to recession and post-recession performance, 2012). The investment strategies included marketing and staff skills.

Research also suggests that adaptability should be planned so that when economic recovery does begin then your firm is in the best possible position. Callahan and Frey (2008) suggest that a firm differentiates their services from competitors and focuses on customer relations to ensure that they are appealing to existing and future customers. The report also suggests that companies outsource specialist services so that they are provided by experienced persons in order to be as effective as possible.

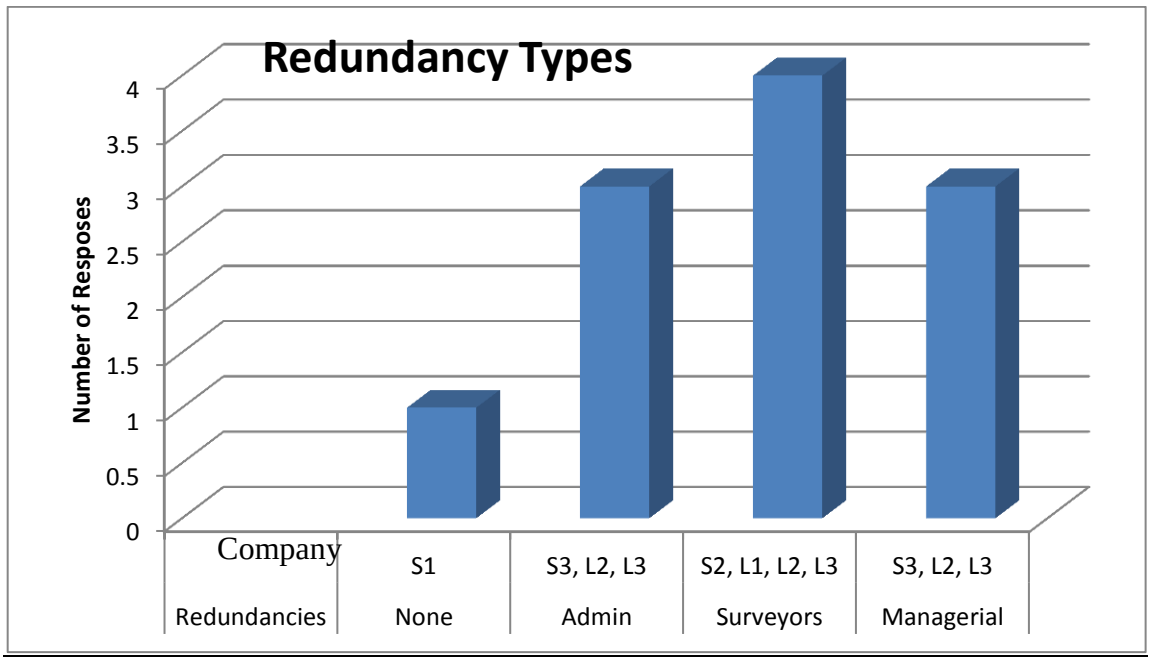
These reports have demonstrated that current methods of adaptation include redundancies and increasing the number of services that can be offered through increasing the firm's skill set.

ANALYSIS AND DISCUSSION

This chapter will provide the results of the interviews and case studies in a tabular and graphical format, with analysis and discussion for four of the themes within this study. Throughout this section the following legend should be used to interpret the graphical information.

Legend			
S1	Small Firm 1 – Interview	**L1**	Large Firm 1 – Interview
S2	Small Firm 2 – Interview	**L2**	Large Firm 2 – Interview
S3	Small Firm 3 – Case Study	**L3**	Large Firm 3 – Case Study
NB: P denotes Participant from specified firm e.g.: S1P			

Redundancies



Graph 2– Redundancy Types

Graph 2 demonstrates that S1 was the only firm not to make redundancies at all. L1 was the only large firm not to make redundancies across the board, although the participant did stress that they joined after the redundancies had been made and only knew of surveyors that were made redundant and could not say for certain if any other roles were cut. This makes this information less reliable and therefore cannot be taken to be 100% accurate.

Interestingly, S1 felt that the ability to make redundancies was one of the aspects that made it easier for large firms to survive in a recession. Large firms are able to cut staff due to having larger number of staff and more departments, whereas small firms often run on the minimum amount of staff necessary. The decision was made to reduce the Partner's drawings and cut costs in other areas in order to prevent them having to make redundancies. L2 however, stated that salaries were intentionally left

at the same level to keep staff morale high, but in turn meant that redundancies had to be made. This demonstrates the different views of redundancies by large and small firms; with small firms viewing them negatively and large firms viewing them as a necessity.

Both S2 and S3 have made redundancies in the last four years, which shows a similarity between the interview and case study data for the small firms. With S2 making Junior Surveyors redundant and S3 making redundancies across the board. S2 felt that the junior staff were made redundant as a direct consequence of the recession, both due to decreased work load and higher competition from other firms.

When S3 decided to make redundancies in October 2008, the firm had recently been bought into by a previous director of a large firm. The new Director had a very corporate view and organised the redundancies and packages available. A total of fifteen staff from across all roles were made redundant, which at the time was a third of their work force. The redundancies were due to a reduction in work load and an ever increasingly competitive market

All of the large firms in the study made redundancies during the recession, showing unanimous implementation of this strategy for the large firms. L2 also made further redundancies following a firm merger. From this it could be inferred that redundancies are a key method of cutting costs during a recession for a large firm.

The interview and case study results are supported by the fact that these large firms are not alone in the decision. In October 2008 it was reported in Property Week that CBRE had announced that 3-4% of their staff would be made redundant throughout their UK offices (Property Week, 2008).

Redundancies were almost seen as a positive strategy by the large firms. Something that had to be done in order to be more competitive and doing so allowed the remainder of the staff to maintain their salary level and employment packages. L2P said:-

> *"Yes, redundancies and one small office in Plymouth did close, but affected staff was next to nothing, but one small office did close."*

A response that seems to lack a personal attachment to the redundancies and office closure.

Whereas in small firms the bonds between staff are generally closer and the senior members of staff would therefore be more willing to take pay cuts in order to save other jobs. This does not seem to be a viable strategy in large firms, perhaps because of the larger staff numbers in the first instance but also because staff would be more likely to leave and go elsewhere. Even during hard economic times it is not uncommon for senior members of large firms to move to other companies or set up their own firms.

L2P stated that it was the emergence of such small firms set up by previous directors of large firms that gave them the most competition as they had much lower overheads but still had the contacts and established relationships with clients.

Personal contacts and bonds with clients enable senior staff to still be able to find work in hard times. It was reported in January 2012 that a King Sturge partner decided to leave following the merge with Jones Lang LaSalle and has set up his own consultancy business, which already works in partnership with Jones Lang LaSalle (Hatcher, 2012). This could be seen as a reason as to why large firms do not employ the strategy of pay cuts, but instead make redundancies as it is the senior staff who often generate the largest fees and use their contacts to gain work, losing these staff to a rival large firm could have disastrous consequences in an already difficult market.

As far as this study has found S1 is the exception, not the rule, deciding to make reductions in Partner's drawings opposed to making redundancies. In doing so all staffing positions were secured and the morale was not decreased as it was in the partner's interest to continue working hard, regardless of the reduction in pay. Redundancies do provide companies with a cost cutting measure but it must be borne in mind that a skeleton staff may not be as efficient and may be strained when workloads increase.

ADAPTABILITY

When asked all of the companies in the study thought that personal adaptability was very important, apart from S1 who thought that it was relatively important. All of the companies on the other hand felt that company adaptability was very important, especially in a changing market.

S1P felt that personal adaptability was only relatively important due to the limited nature of multi-skilling within surveying, with S1P saying:-

> *"People tend to be good at certain things and not as good at others, or you were trained to do one thing and not another."*

S1P also added that adaptability is limited by regulations of the RICS by stating:-

> *"That is another issue, it became even more regulated at the beginning of ... 2010. Anyway we all have to be certified valuers now."*

The main emphasis for the participants of the large firms feeling that personal adaptability was important relates to the likeliness of retaining your job. L1P one stated that personal adaptability was important because:-

> *"Generally they downsize teams to sort of save money and it puts more pressure on one person. If you can show that you can take that on and have the skill set to take on a couple of people's jobs then you are more likely to stay than someone that is only good at their job."*

This was reinforced by L2P who stated:-

"Yeah, you're more difficult to get rid of! As opposed to one of your peers that does the same job, from a pessimistic point of view, but you have additional responsibilities in the office then if you went head to head with that person then you've got more chance of staying and proving your worth."

S1P also felt that company adaptability was important but stressed that knowing the areas which to move into were not always clear:-

"But its knowing where you should concentrate on, I think actually, that's the skill."

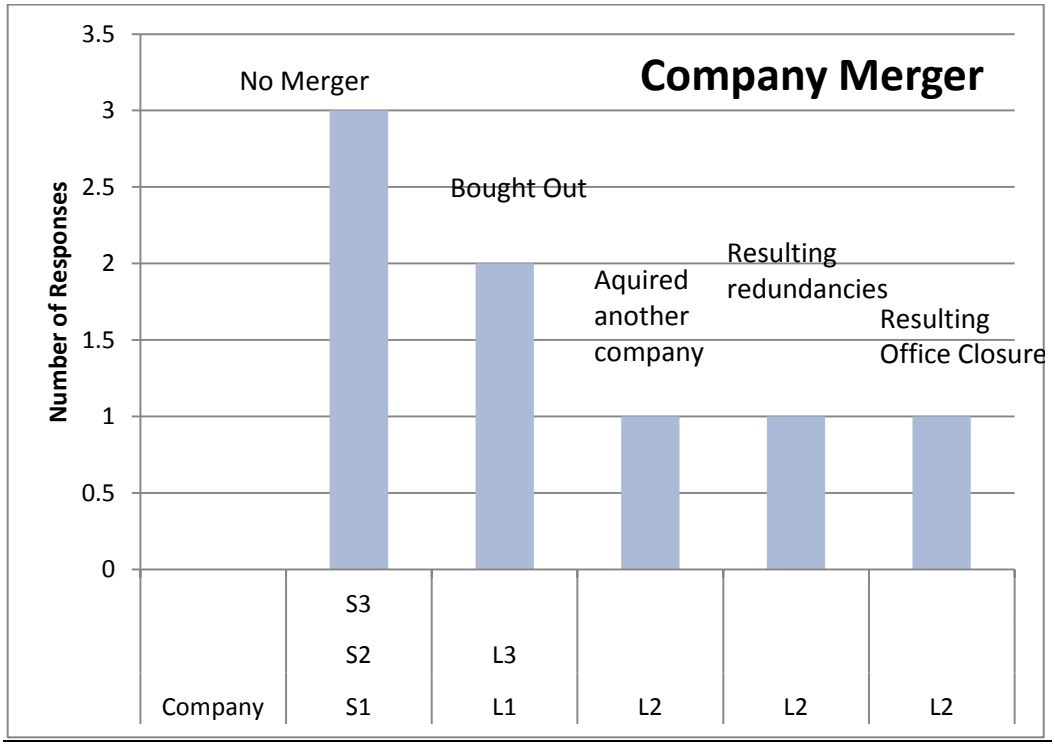
When asked about guidance being available on such matters S1P replied:-

"I don't think there is any guidance. I don't think there is any guidance because it will depend on the type of firm that you are in the first place really."

This demonstrates that adaptability can be very valuable to a firm but knowing how to adapt the range of work provided can be difficult

The firms generally agreed that adaptability is important, especially in a competitive market. But the feeling of S1 and S2 are more that personal adaptability are limited to what your staff are good at and trained to do. The view of the small firms of the limitations of adaptability for surveyors is mirrored in the CIC (2010) report that states that only 15% of SME's that were surveyed felt that the ability to multi-skill was important. This could be a reflection of the courses such as 'negotiation' that the large firms provided that allow their staff to become more adaptable and competitive within the work place, but it could also be a reflection of the characteristics of a large firm compared with those of a small firm.

Mergers



Graph 3 – Firm Mergers

From Graph 3 we can see that none of the small companies merged, however all of the large companies have merged. In the case of L2 it was that firm that in fact acquired another large firm, whereas L1 and L3 were acquired by another firm.

However, shortly after L2 acquired the other large international surveying firm they made redundancies throughout the UK and closed one office due to an overlap in staff skills. The merger however was felt not to be an effect of the recession by the participant, rather a strategic move to heighten the firm's profile.

In contrast when L1 was asked if the merger was a direct result of the recession, L1P responded:-

"Yes, it has yes. We went into administration so someone bought us."

This indicates that the merger was a strategy that was forced upon the firm in order to survive in the climate, as opposed to being a strategic method to increase the firm profile or portfolio of clients.

L1 was only merged one month before the interview and at that point had not made any redundancies or office closures. This was felt to be unlikely by the participant as L1 had been merged with a Holdings company so there was no overlap in staff roles. L1P did however say:-

"I think they might look to review where we are effective or ineffective, might do a more strategic review of the company."

This could be interpreted as a review of costs as well as firm effectiveness. This could result in 'streamlining' departments or merging offices that are in close proximity geographically

It is important to highlight here the different types of mergers that have been identified in this study. L1 and L3 were forced to merge as an effect of administration whereas L2 acquired another large firm in order to heighten their profile. These are two very different types of perspectives but both are seen as positive by the large firms. L1 and L3 were able to continue through the buy outs and L2 benefited from the publicity of the acquisition. The fact the L2 acquisition was portrayed as a merger in the media indicates that it was a mutual benefit to both companies, opposed to the acquired firm needing to be bought out due to financial crisis. The knock on effect of redundancies were once again seen as a necessity by L2 and not as a negative impact of the merger. The redundancies seeme to be viewed as a logical step following the merger of offices in the same geographical location which in turn lead to a surplus of staff in some departments.

This report finds that mergers are generally done by large firms either to survive or to increase firm profile. Small firms however tend not to merge, whether this be due to the threat of resultant redundancies or whether the mergers would be in the format of an acquisition by a large firm that would in turn end the firm name. Either way mergers are seen as a negative strategy by small firms, but as a positive one by the large firms in this study.

Marketing

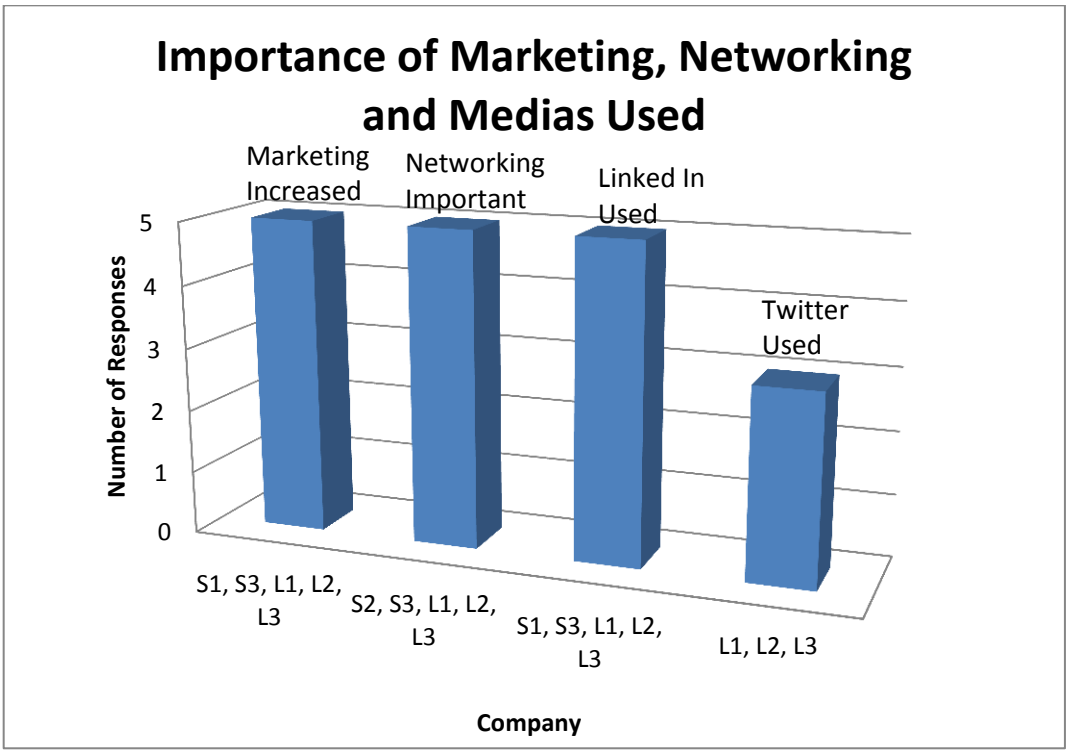
Graph 4 shows that all of the companies, apart from S2, thought that marketing is important and have increased their marketing strategy accordingly. All of the large firms employ social media to enhance their brand (use of "Twitter"), whereas the small companies have not used social media. All companies had employees that were on "Linked In", apart from S2. All of the companies, apart from S1 agreed that networking was a good way to market the firm and helped increase work gained.

The firms that had increased the level of marketing all said that it was as a direct result of the recession and as a consequence of competition from other firms. L1 also felt that marketing was a way in which good things about the firm could be circulated, opposed to negative press that is widely circulated in publications such as egi and Property Week. L1P stated:-

"Everyone is happy to share a bad story about firm; whether it's that they have made redundancies or you know [that] they have made a financial loss. So it's our opportunity to say yep, we have all been in the recession and we have come up and are alright and these are the good things that we do."

This type of 'positive PR' is made easier through the use of media applications such as "Twitter". All of the large firms used "Twitter", again, to increase firm profile,

something which does not seem to have been done or given as much emphasis by the small firms in this study.



Graph 4 – Importance of Marketing, Networking and Medias Used

S1 felt that networking was often done with persons in the same role and therefore was not conducive to creating new work. S1 also felt that networking to increase work load often required a level of 'poaching' clients from their existing providers and attracting them to your firm, something S1 was not prepared to do, albeit knowing that it very much happened, S1P stating:-

> *"I'm not one for persuading someone to come to us to do a job rather than the person that they are already with, because I'm just not bred that way. I don't think it does you any favours in the end to be honest with you, because it will happen to you, someone will try and take clients away from you. Which they do, I know they do actively do that, but I don't personally prescribe to that view."*

Marketing is clearly a favoured strategy employed by the majority of the firms in the study as a method to create new work. The benefits of social medias and networking however seem to create a divide between the large and small firms, with large firms having a more positive view on the results than the small firms. Marketing is a viable strategy for a firm of any size when used to increase the number of clients that they have. The most effective method in which this is done however is not clear from the study, but social medias are clearly favoured by large firms.

Marketing is used by all of the firms to raise firm profile and increase client base. Perhaps this is harder for small firms as marketing would need to be outsourced whereas the large firms all have marketing departments and therefore have employees with the required skill set. This could be an area that the small firms could look at evolving through training, which would lower marketing costs in time through the reduction in outsourcing the work

CONCEPTUAL MODEL DEVELOPMENT

The models in this section have been developed through the analysis of the data both from the primary and secondary research in this study. The Author realises that the models will not be suitable for all types of surveying firms, but to increase their usability each action step in the models provides suggested options that provide a range of steps that could be taken in order to survive in a recession.

Two models have been formulated as the differences in approach by small and large firms found through primary research have been mirrored by the secondary data collected for this study. Model 1 has been developed for small firms (Figures 1 and 2) and Model 2 has been developed for large firms (Figures 3 and 4). Each model has two phases, the first being retrenchment and the second being investment. This enables the models to provide an ambidextrous approach (Kitching, Business strategies and performance during dificult economic conditions, 2009) and provides guidance not only for use during a recession but also for the firm's growth during economic recovery.

This research found that retrenchment is key to enable a firm to initially reduce costs, but investment is essential to allow a firm to be in a strong and competitive position when recovery begins.

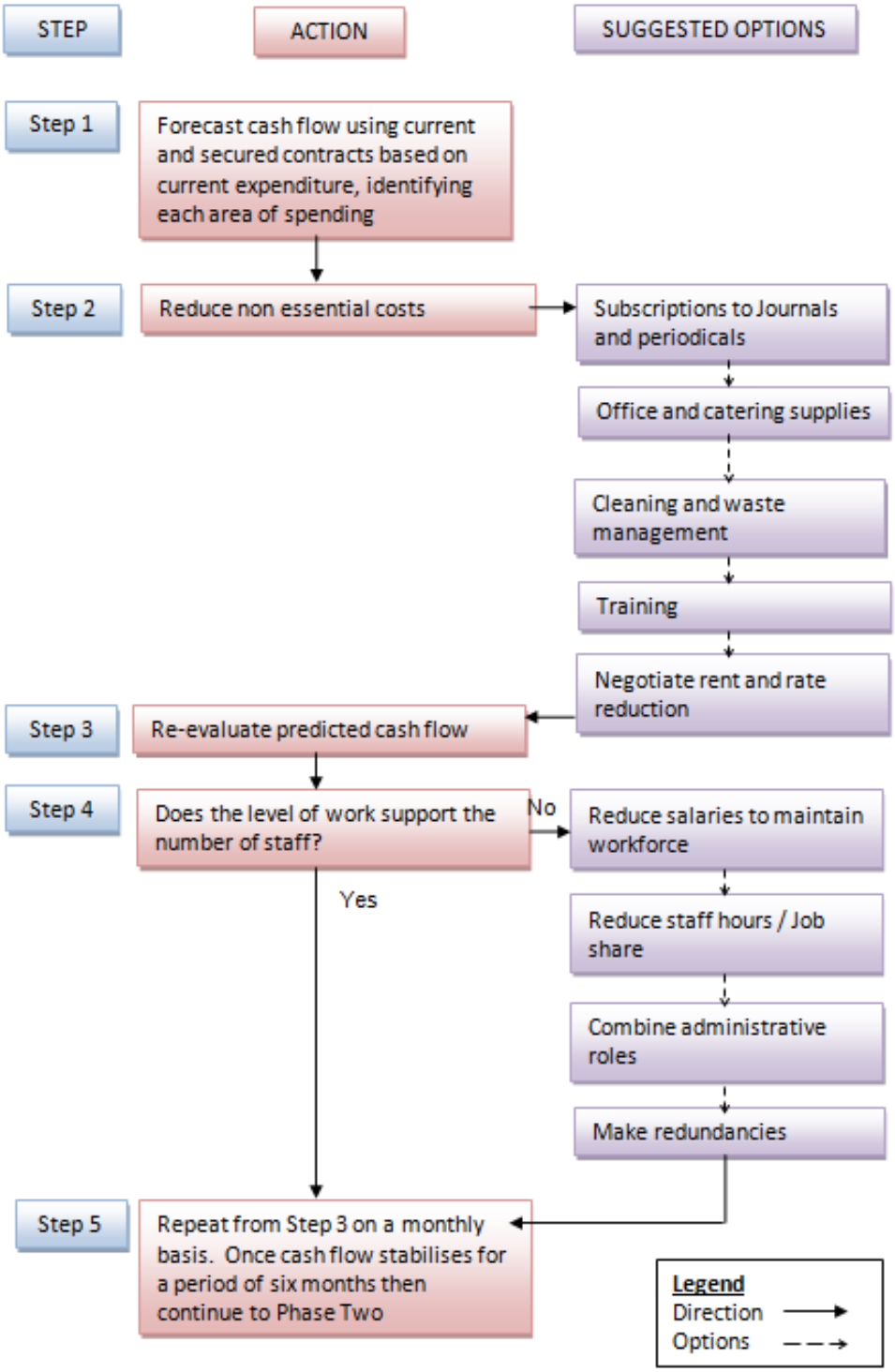


Figure 1 Small Firm Model – Phase One - Retrenchment

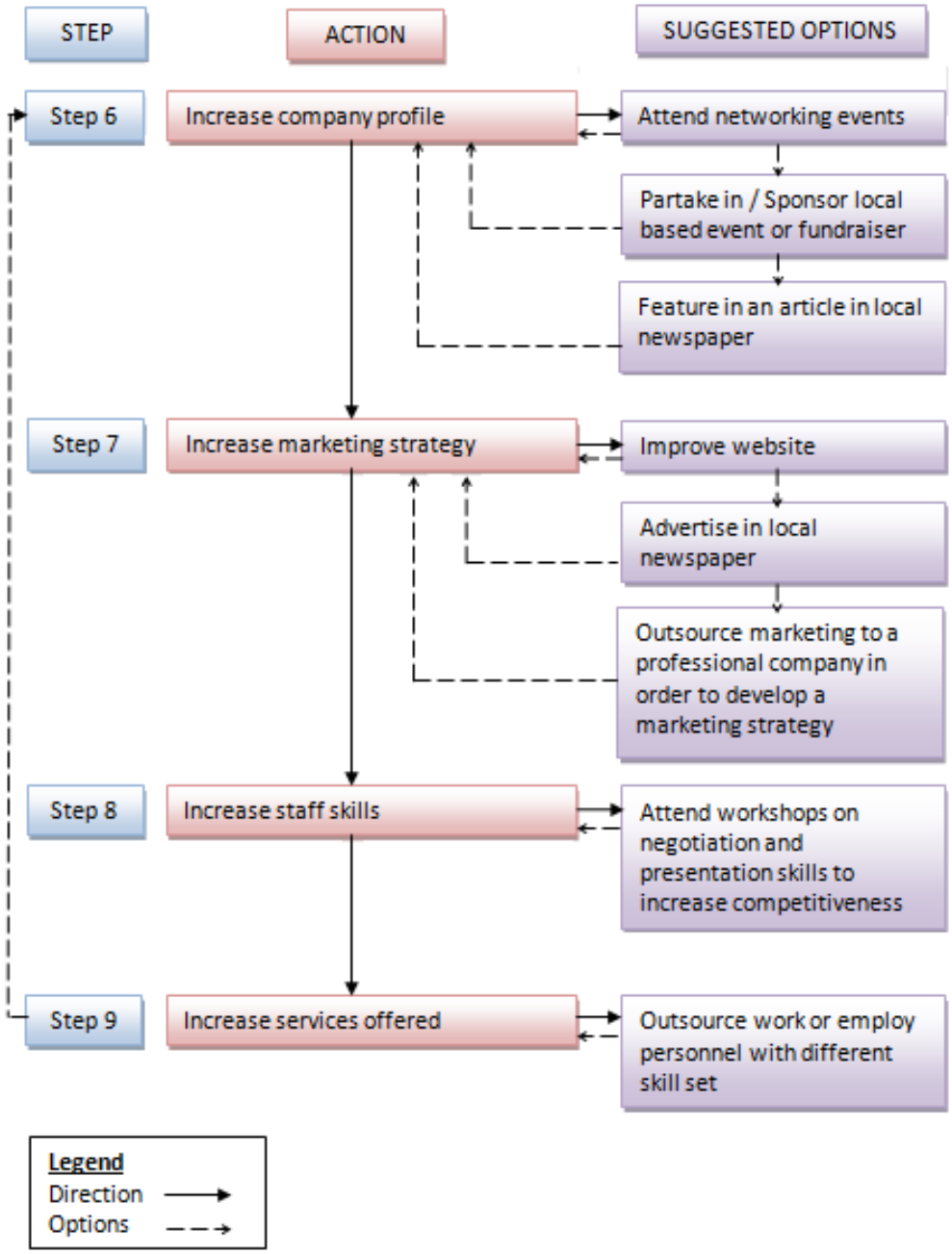


Figure 2 Small Firm Model continued – Phase Two- Investment

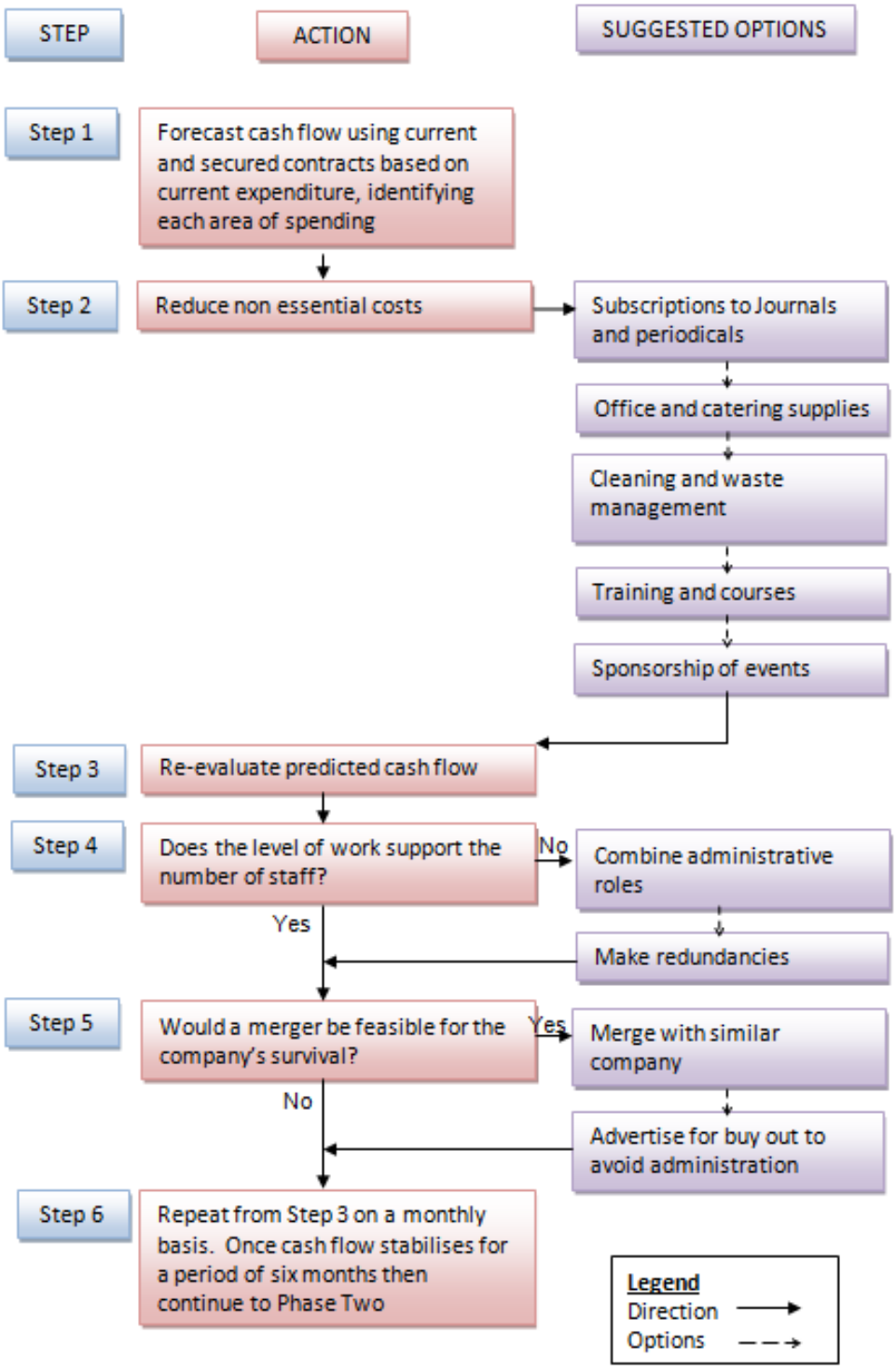


Figure 3. Large Firm Model Phase 1 Retrenchment

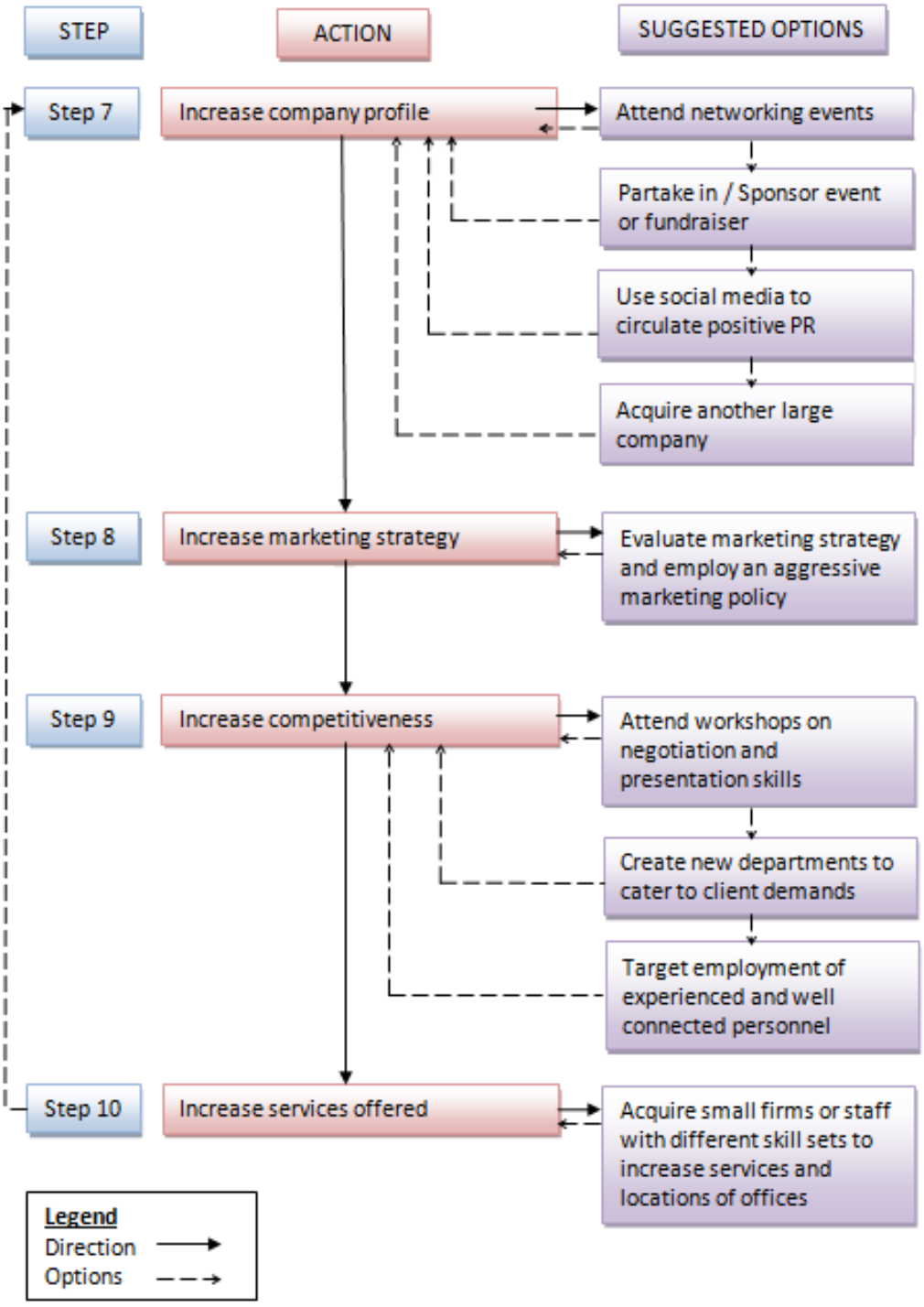


Figure 4. Large Firm Model continued – Phase Two

CONCLUSION

Key adaptability methods were researched through the literature review, which helped the Author focus the question set and produce concept-driven codes to analyse the primary data collected. The key methods of retrenchment and investment were highlighted through the literature review and the findings of the primary research were that the methods used by small and large firms differed greatly. The large firms within this study all applied an ambidextrous strategy, firstly by cutting costs through redundancies then by investing in new skills through creating new departments or acquiring small firms. The strategies of the small firms within the study seemed to differ greatly from one another, highlighting the unique circumstances of small firms. Although all of the small firms have employed retrenchment methods, little consideration had been given to investment strategies. Marketing, alongside personal adaptability seemed to be two of the most important concepts to the firms interviewed in terms of building a stronger client base whilst recovering from the recession.

In conclusion this study has found that although the initial impact of a recession is generally negative upon surveying firms the recovery period can be used to strengthen the firm's position to create a competitive edge when economic recovery has been achieved by the UK economy. This can only be achieved through an ambidextrous strategy, which currently does not seem to be employed by many small firms.

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TO IDENTIFY THE MECHANISMS BY WHICH LEAN CONSTRUCTION CAN BE INCORPORATED INTO THE PLANNING STRATEGY OF A CONSTRUCTION COMPANY

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Problems connected with the UK construction industry are well documented. Morton (2002, p7) states “the most persistent problems are that it costs too much, takes too long and produces poor quality” whereas Forbes and Ahmed (2011, p.xxvii) believe "the construction industry lags far behind the manufacturing and service industries with regard to the application of performance improvement and optimization techniques". Various parliamentary reports have been produced voicing concerns surrounding the poor performance which has been on-going for many years. Findings from the reports discover that the construction industry needs to increase productivity to remain competitive, within an ever changing economic environment. Halpin and Senior (2010, p.153) describe "the adaption of lean techniques for construction has been a gradual process that began in the mid-1990’s, with techniques that attempt to mimic the essence of Toyota systems". The majority of the current lean construction lies within the essence of project planning and control. During 1988 Sir John Eagan suggested that the construction industry ought to implement lean production principles which the manufacturing industry adopts for a model of change, highlighting the prospect of it being the right explanation to diminish problems persisting in the industry. Forbes and Ahmed (2011, p.xxvii) state that "construction organisations that fail to utilise the foregoing approaches will find themselves at a competitive disadvantage". Examination embarked upon current discussions with regards to whether the construction industry is progressing with regards to the principles and processes of the manufacturing industry. Numerous similarities arose between the two sectors, discovering individual’s vague perceptions that act as substantial obstacles in adopting lean techniques. The core findings conceal that lean production principles are evident within the construction sector, with

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substantial potential for improving efficiency. However it is clear a lack of understanding still persists to date, nevertheless it is established that lean production remains a probable solution for improving efficiency within construction, evolving the principles to overcome individual perceptions and issues that persist within the UK construction industry.

Keywords: construction, industry, lean, manufacturing.

INTRODUCTION

Within the UK construction industry numerous problems have occurred, this which has been well acknowledged over the years. The construction industry has lagged behind manufacturing in terms of productivity for several years. Due to the persistent poor performance the government has undertaken investigations in an attempt to resolve the matter producing reports such as Emmerson (1962), Banwell (1964), Latham (1994), and Egan (1998) expressing great concerns, highlighting the solution for the problem has increased productivity enabling the construction industry to remain competitive. The reason behind focusing on lean construction and productivity arose primarily whilst undertaking industrial placement during the Bsc (Hons) Construction Management degree. Aiming to explore how far the UK construction industry has embraced the lean way of thinking since the Egan report which was published in 1998 establishing if lean construction is a solution to improving competence in the UK construction industry. The whole concept of lean thinking originated in the 1950's from the Japanese car manufacturing industry. *The Machine That Changed the World* states lean production welds the activities to everyone from top management to line workers, to suppliers, into a tightly integrated whole that can respond almost instantly to marketing demands from consumers which can almost double production and quality, while keeping costs down.

The Latham report (1994) *Constructing the Team* was a joint course of action by both the government and the industry reviewing procurement and contractual arrangements within the UK construction industry. Various recommendations made were originally implemented in previous reports, whilst other problems still persisted. The 1998 report *Rethinking Construction* produced by Sir John Egan, potentially had the solution to these problems coming from the Japanese car manufacturing industry in the form of 'Lean Production'. The report inspired the UK construction industry and in 2003 went on to create the Construction Lean Improvement Programme (CLIP) which tailors the needs of its customers providing better products and the overall service, improving its financial performance. CLIP operates throughout the whole construction supply chain.

RATIONALE

Primary data was collected via interviews, questionnaires, and case studies. Interviews consisted of note taking and the use of a Dictaphone using set questions throughout ensuring a fair result. Both closed and open questions used were sent out to organisations to complete, or alternatively completing an online survey (SurveyMonkey™) which was circulated between numerous organisations ensuring all identity was anonymous. Finally case studies were used, helping to produce better conclusions due to case studies being based upon something that already exists, secondary data was also used. Ensuring a non-biased approach was taken all data was thoroughly analysed and compared together, gaining a clear understanding of what professionals in the industry actually understand regarding the term lean and how much it is used inside the organisation, if any. The reason behind triangulating the primary data is to get more than one view on the particular subject which can be combined together triangulating the data gathered ensuring a non-biased approach is obtained, conclusions and recommendations were then made.

LITERATURE REVIEW

As emphasised within the introduction numerous problems occur within the UK construction industry which is well documented. Several authors had a potential solution to the problems that persisted in the construction industry, Sir John Egan produced a report *'Rethinking Construction'* in 1998 demonstrating the Japanese car manufacturing industry was the way forward, proposing to adopt lean production highlighting the car industries excellent success rate. Egan (1998) describes "The opening of the Nissan, Toyota and Honda plants in the UK showed that this level of performance could also be achieved in plants outside Japan. Western car manufactures then began crash programmes to implement 'lean production' systems in order to close the gap" moving on to define, that both time and effort has been drastically reduced resulting in double the production demonstrating improvements within the UK car industry.

Lean construction is a philosophy: therefore it can be pursued through different avenues, which is based upon lean manufacturing. It is built around the construction process improving management and maximising profitability whilst delivering the customer's needs (Womack and Jones, 2003). Lean manufacturing was originated and further developed in the Japanese car manufacturing industry. With proven success lean manufacturing was expanded by both American and European manufacturers. Lean principles consisted of eliminating waste, adopting the 'Just-In-Time' (JIT) method, allowing the customer pull, only making products when needed then making them quickly, implementing the value stream. Clearly identifying what the customer needs and finally continuously improving by pursuing perfection. It is just as important, feedback is received both positive and constructive, allowing further improvements to be adopted. The perception of JIT is mainly focused on improving resources flow and reducing work in progress alongside increasing flexibility in terms

of stock levels. JIT works effectively when goods are made available at short notice evolving into a pull planning system; however JIT relies enormously upon the partnership between both the contractor and the supplier, due to the cost implications with small deliveries.

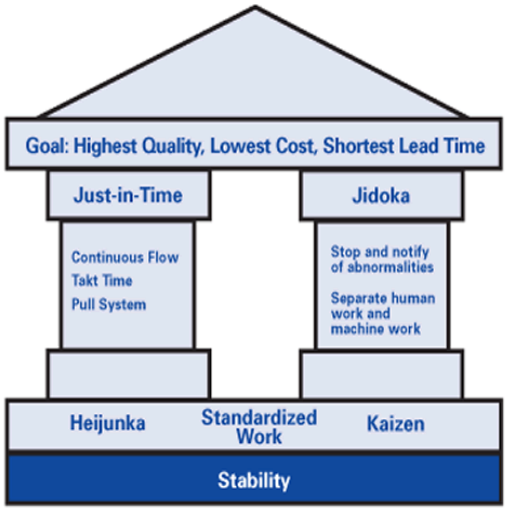
Womack and Jones (2003) believe there are five lean principles which are:-

1. Value
2. The Value Stream
3. Flow
4. Pull
5. Perfection.

Lean thinking was instigated from lean manufacturing, adopting the way production is made, producing a new production philosophy implying the lean principles, where waste is eliminated and effort is increased, resulting in reducing the total costs and doubling production. Womack, J and Jones, D (2003) states that "lean thinking is lean because it provides a way to do more and more with less and less, - less human effort, less equipment, less time, and less space, whilst coming closer and closer to providing customers with exactly what they want." Moving on to further elaborate by defining lean thinking also provides a way to make work more satisfying, providing direct feedback on efforts to convert waste into value (Womack & Jones, 2003) Less procedures/steps were implemented as those found to be no-added value were removed. All employees adopting lean were introduced to a whole new approach producing a new way of working, applying new techniques that were not used, such as engineering, analysing the value stream and the JIT method.

A high percentage misunderstand the term lean, believing it is only used within manufacturing, however this is not true as it is a way of thinking and applies to every business and process. The majority of organisations decide not to use the term lean, instead brand what they do as their own system. An example of this is the 'Toyota Production System' (TPS) known as the Toyota house, directed by engineer Ohno, demonstrated (Figure 1). Lean is not a programme it is the way the company functions and operates (Lean Enterprise Institute 2009).

The TPS was built upon stability and divided into two theories, firstly being 'Jidoka' and secondly JIT. Jidoka is described as during the manufacturing process, quality must be achieved, whereas JIT is known as producing what is needed, the amount needed and when it is needed. Watson (2007, p.218) describes "the result of this effort was the development of what we called a 10-S approach to lean management. This approach builds on the elements of the TPS and is a natural extension of the 5-S housekeeping method". Table 1 summarises the 10-S approach.



Toyota Production System "House."

Figure 1: Toyota Production System (With Friendship.com, 2001)

Elements of the 10-S Approach	Summary Description
Study	Analyze work to find waste and value losses.
Sort	Divide work into categories according to value.
Sanitize	Clean the workplace to make waste visible.
Systematize	Organize the flow of the work activity.
Streamline	Eliminate unnecessary activities.
Simulate	Check work performance prior to change.
Synchronize	Set the timing for optimal work flow.
Safeguard	Eliminate the possibility of mistakes.
Standardize	Assure all work follows the standard.
Self-Discipline	Consistently perform and improve.

Table 1: The 10-S approach incorporating into the TPS (Watson, 2007)

The construction industry has ignored looking at manufacturing ideas, as it is alleged they are both different industries. Manufacturers make parts that go into projects but the design and construction of unique and complex projects in highly uncertain environments under great time and schedule pressure is fundamentally different from making tin cans. Obviously managing construction and implementing lean is diverse from usual modern practice due to having clear, set and precise objectives under the delivery process, maximising the performance for the customer, and applying

production control throughout the project (Howell, 1999, p4). Botero and Alvarez (2005) believe that "one of the most effective methods to increase productivity is planning appropriately. This improves production because waiting times are avoided, a more convenient sequence of activities is followed, and the reliance of multiple activities is coordinated."

Combined with planning appropriately, time is a major element for any project, therefore keeping positive control of time is key, thus a plan must be adopted for without a plan chaos would ensue. Once a plan is constructed it must be supplied to all those who have need of it.

CIOB (1991) states that "the planning/programming function can be separated into two main categories:

a) That which evaluates various construction strategies, options and/or contractual routes in order to determine project durations, rate of spend etc.
b) That which is required for performance assessment and control purposes".

Howell (1999) says that "lean construction much like current practice has the goal of better meeting customer needs whilst using less of everything. But unlike current practice, lean construction rests on production management principles, the 'physics' of construction. The result is a new project delivery system that can be applied to any kind of construction but is particularly suited for complex, uncertain, and quick project". Under lean the managing of construction differs from typical practice due to maximising performance, products and process, outlining clear objectives and production control throughout.

Overview of 'The Last Planner System of Control' (LPS)

Last planner (LP) was originated by Glen Ballard in the l990s, which evolved further in the year 2000 when both Ballard and Howell "designed a new planning and controlling system, known as the *'The Last Planner System™'*, which introduced fundamental changes in the way construction projects are planned and controlled" (Botero and Alvarez, 2005, p1). Salem, Solomon, Genaidy and Luegring (2006) describes that the LPS is the leanest system available which is established, tried and tested and most appreciated. LPS incorporates the Plan-Do-Check-Act (PDCA) cycle, which safeguards the operations throughout uncertain construction procedures. The PDCA is similar to the Toyota cycle in the sense that their cycle consists of plan, try, reflect and standardise whereas PDCA incorporates planning, doing, checking and acting upon as shown in Figure 2. Samudio, Alves and Chambers (2011) state "LPS relies on information provided by those close to production (the last planners) to define weekly work packages based on information coming directly from the field. Ideally last planners select (pull) work packages from a pool of tasks screened for constraints in a previous phase, i.e. the make ready process during the look ahead plan preparation".

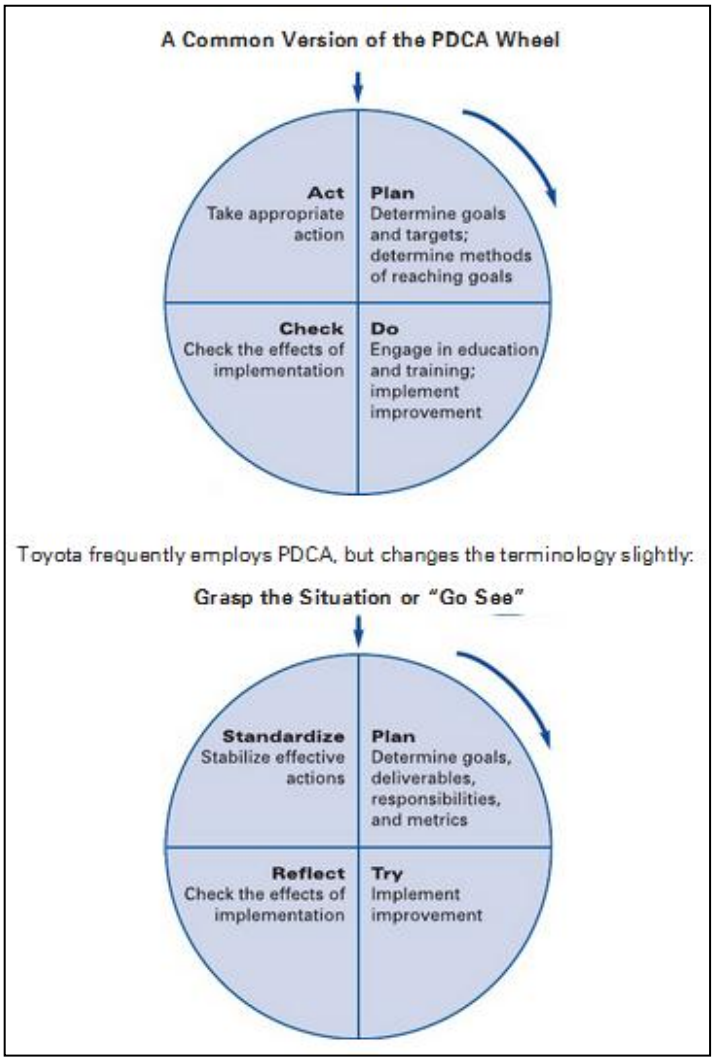


Figure 2: PDCA and Toyota cycle (The Lean Enterprise Institute, 2008)

The LPS acts as an essential planning tool, primarily focusing on the planning and control to manage all work throughout a specific project whether it is complex, uncertain or a short programme of time. The meaning of planning is something that is to be done and the process in which it is undertaken, and control is the process of making it occur. Once everything is accomplished from the planning section this is when the project is under control. The actual design of the LPS allows a stable system to be in place. For the system to work to its full potential it relies heavily on those individuals involved by making and keeping commitments. Several techniques are utilised throughout, percentage plan complete (PPC), reverse phase schedules (RPS), weekly work plan (WWP), followed by the six week look ahead (SWLA) and finally the master schedule/programme. The system aims to adopt a modern planning pull technique to ensure the sequence is constant allowing a fluent flow and exploit capacity (Howell, 2002).

Litchtig, Holland and Allen (2005) state “proper use of LPS produces reliable work-flow and stabilises the project. It results in reduced costs, shortened durations, increased quality, and increased safety”. Moving on to define that if LPS is employed, it will “produce stable work flow, allowing the project team to explore other opportunities to eliminate waste from the design and construction process”.

Within the WWP, Ballard (2000) highlights how *Should*, *Can* and *Will*, is implemented inside the system.

- *Should*: Specifies work in accordance with the schedule requirement that is required to be undertaken.
- *Can*: Specifies the work which can be accomplished.
- *Will*: Reflects the work obligations.

Figure 3 demonstrates the traditional method (Should, Can, Will) which is implemented within the LPS.

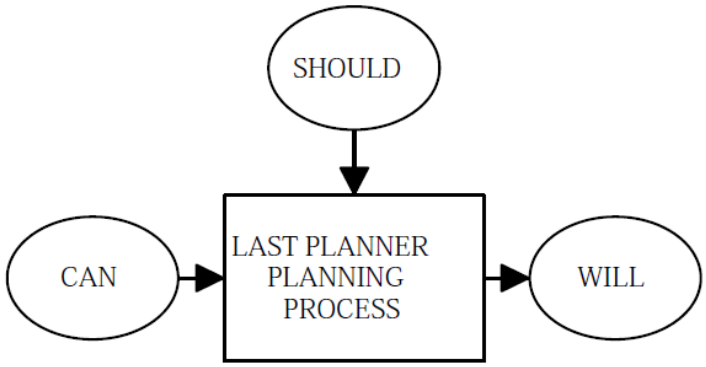


Figure 3: The Last Planning Process (Ballard, 2000)

Throughout LPS the workflow is constantly progressing due to fundamental contributions that occur consisting of: analysing regularly (before, during and after completion), communication, effort, and the overall training aspects of all employees working together. It is clear that numerous authors have tried to implement lean within the construction industry however have not been very successful, due to the majority believing the manufacturing industry is completely different to the construction industry, therefore not changing the way the company/organisation operates. Lack of knowledge plays a crucial part in why companies haven't applied the lean way of thinking within the organisation, maximising production and minimising waste. It is clear that those organisations that implement lean construction have a beneficial return on the organisation saving money, producing more products, and meeting client’s expectations. Applying lean, improves planning techniques within the organisation with a set plan implemented, that helps the management to ensure that time frames are achieved.

RESULTS

Overall the response rate to the circulated questionnaire was extremely good, a total of 37 companies responding out of 60 which equates to a 61.66% response rate, which was more than anticipated. Figure 4 demonstrates the response rate classified according to the annual turnover for each company, categorised as up to £5M, up to £50M, up to £100M, up to £500M and finally £500M+.

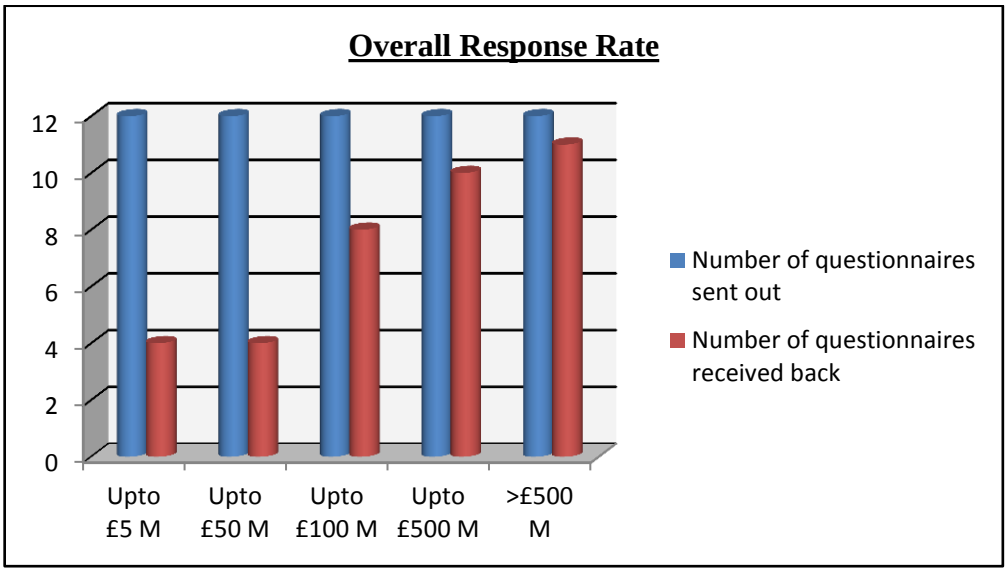


Figure 4: Overall Response Rate

It demonstrates that those organisations with a £500 million turnover or greater, have the highest response rate suggesting this may be due to those companies only having one head office allowing an easier despatch to the most suitable and relevant sector.

Calculation of Data

Various options relating to the understanding of all the data received from each respondent was judiciously considered. The first preference which was considered was to calculate the mean for each question, although this method failed to distinguish both 'lean' and 'non-lean' organisations due to being misleading, the chosen solution was to calculate each value, expressing as a percentage for each categorised section emphasising the number of responses for each question asked.

Best Practice

The best practice section covers questions 1 to 3, intending to demonstrate the current commitment of organisations; discovering those companies dedicated to change; those generally adopting lean construction principles from the manufacturing industry alongside highlighting whether organisations feel they work better when adopting best practice.

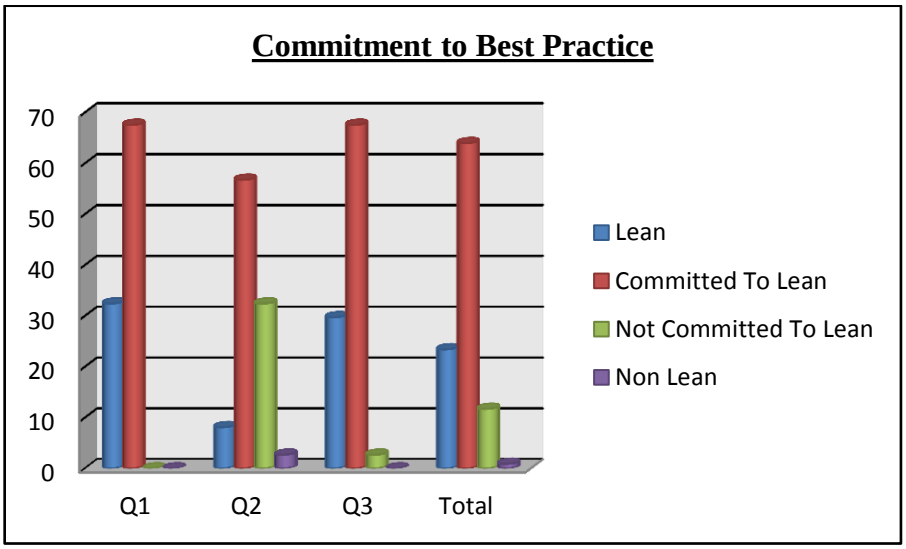


Figure 5: Commitment to Best Practice (Questions 1 to 3)

Question 2 was direct in terms of examining whether an organisation adopts lean construction principles. The purpose behind this question was to establish if those companies claiming to be 'lean' were essentially fulfilling the 'lean policies'. Figure 5 demonstrates that 8.11% of organisations claim to be lean, alongside 56.76% which are committed to lean, whereas 32.43% state they are not committed to lean and 2.70% affirming they are not lean. However in comparison with question 3 when asked if their organisation works benefitted when adopting best practice only 2.70% were not committed to lean, which perhaps suggests the meaning of 'committed to lean' differs company to company as over 30% do not adopt lean principles.

The results gathered from the best practice section confirm that a large proportion are claiming to be lean, when perhaps they are not. Lean appears to be a term the majority of clients are attracted to, however if an organisation is lean it will demonstrate a continual improvement approach being embraced, again clients may misinterpret this believing continual improvements are due to the overall accomplishment of their development is lean.

Procurement

The procurement section covers questions 4 to 6 which aimed to establish the extent of companies seeking alternative procurement routes such as partnering, which generates an ecological implementation of lean.

Figure 6 demonstrates that (question 4) 48.65% are to a degree agreed that the organisation ensures a partnering ethos is implemented with 21.62% being entirely dedicated. Comparing these results with Ledger (2004), who established that 57% of his respondents were strongly committed to implementing partnering within their organisation, the 2011/12 results show a reduction by over 30% than Ledger's (2004) results, potentially due to the significant impact of the current economic climate as companies tender on either extremely low margins or no margin to win the tenders,

aiming to recoup some of the costs from subcontractors. This is in contrast to 2004 when Ledger undertook his research when the economic climate was in a state of boom and the majority of organisations ensured partnering was implemented to have the edge over competitors and win contract. Now it seems organisations are winning contracts based on the competitive principles of the lowest price wins.

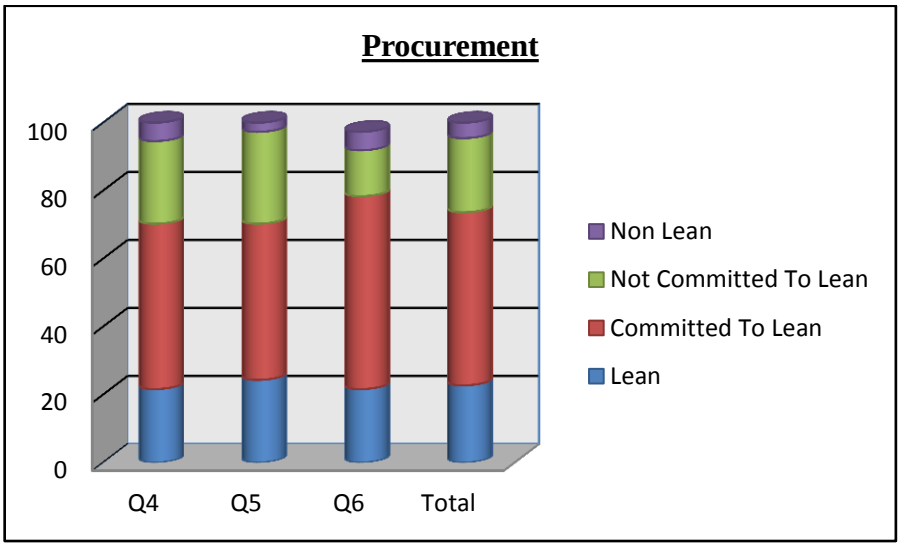


Figure 6: Procurement (Questions 4 to 6)

Supply Chain Management

This section covers questions 7 to 9 which are closely related to the previous section (procurement) and is primarily focused on whether an organisation is pursuing to improve the supply chain management, helping to create a sustainable lean application.

Question 7 demonstrates that only 8.11% are fully committed (lean) to selecting sub-contractors on the basis of both quality and the employment of "Just in Time" quality of control, however a large proportion attempt to be committed to lean 54.05% as opposed to 35.14% that are not committed to selecting sub-contractors on those basis but on the lowest price.

Question 8 demonstrates that the majority of organisations rarely utilise incentive schemes as only 43.24% promote such schemes. In summary this distinguishes an area of improvement, due to incentive schemes proving incentives that ensure both work and targets are achieved more efficiently. Chitkara (2009, p243) describes that incentive schemes "helps workers in increasing their earnings and gaining job satisfaction without affecting the estimated costs of work. It also encourages workers to develop better methods of working".

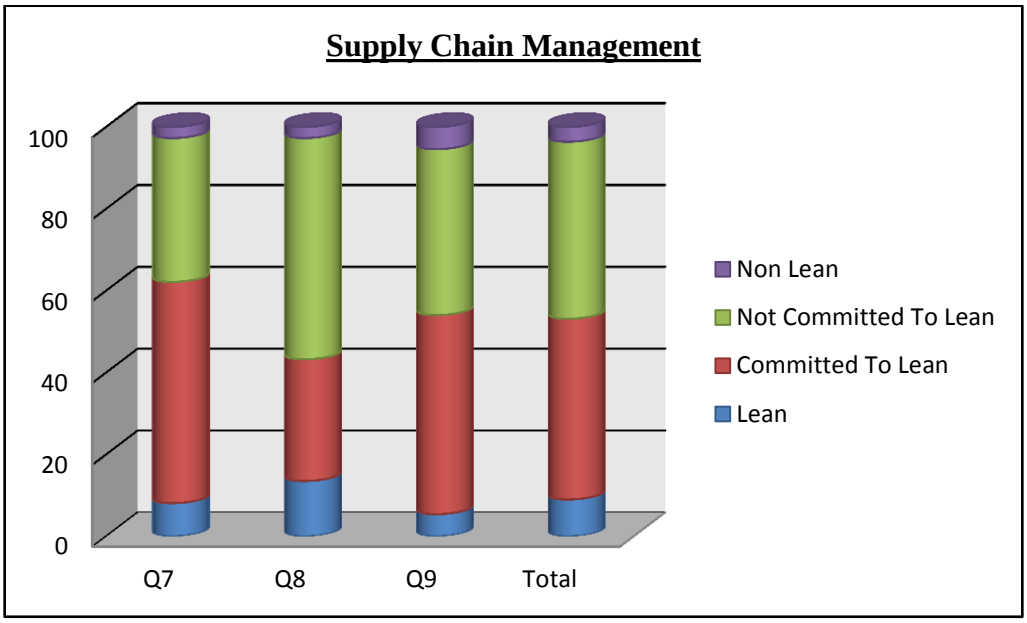


Figure 7: Supply Chain Management (Questions 7 to 9)

Quality Systems

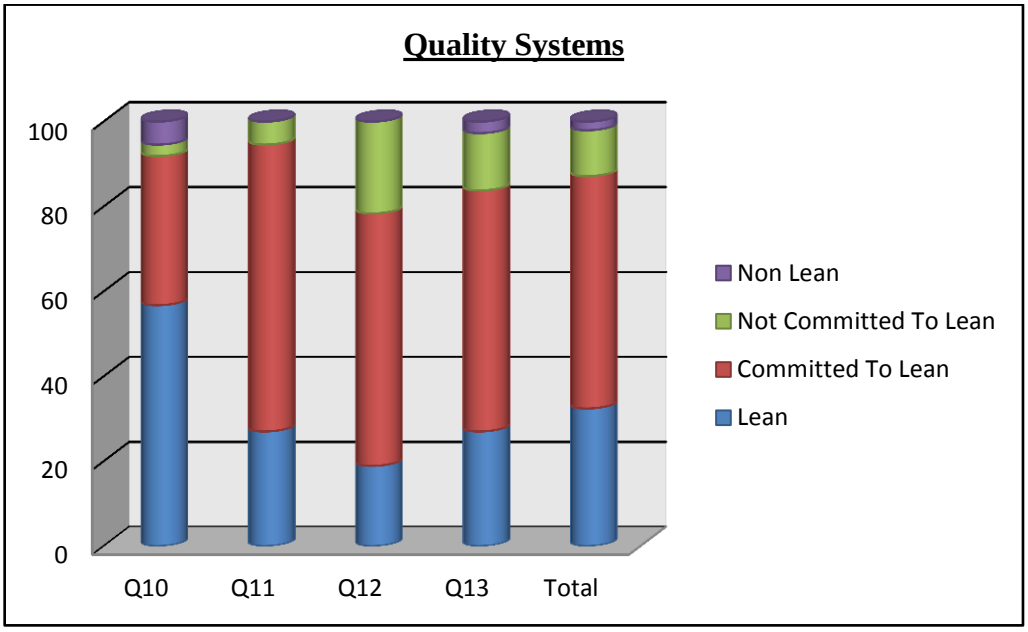


Figure 8: Quality Systems (Questions 10 to 13)

This section specifically focuses on discovering extent to which organisations implement quality management systems, covering ISO 9001 and total quality management systems (TQM) helping to highlight if a philosophy for lean policies is apparent.

In general a large proportion of respondents implement quality systems within their organisation as a whole. Over 90% expressed that their organisation implements ISO 9001, however only 67.57% partially committed to lean, by ensuring that both sub-contractors and suppliers implement a TQM system whereas only 27.03% fully committed to lean ensuring both sub-contractors and suppliers uses a TQM system.

Although figures clearly show signs of the construction industry implementing quality systems within their organisation, it is clear there is room for improvement as 21.62% do not review quality plans regularly therefore are not fully committed to lean.

Question 13 asked if their company provide relevant information regarding schedules, quality, job status, productivity and safety to employees, collated figures demonstrate that only 16.20% of respondents do not implement this (not lean), nevertheless over 80% showed that there are signs of relevant information being provided, this highlights that visual aids/tools are being incorporated. A lean philosophy relies heavily on the use of visual tools, though these visual aids still need to be reviewed with staff as well as published appropriately.

People and Culture

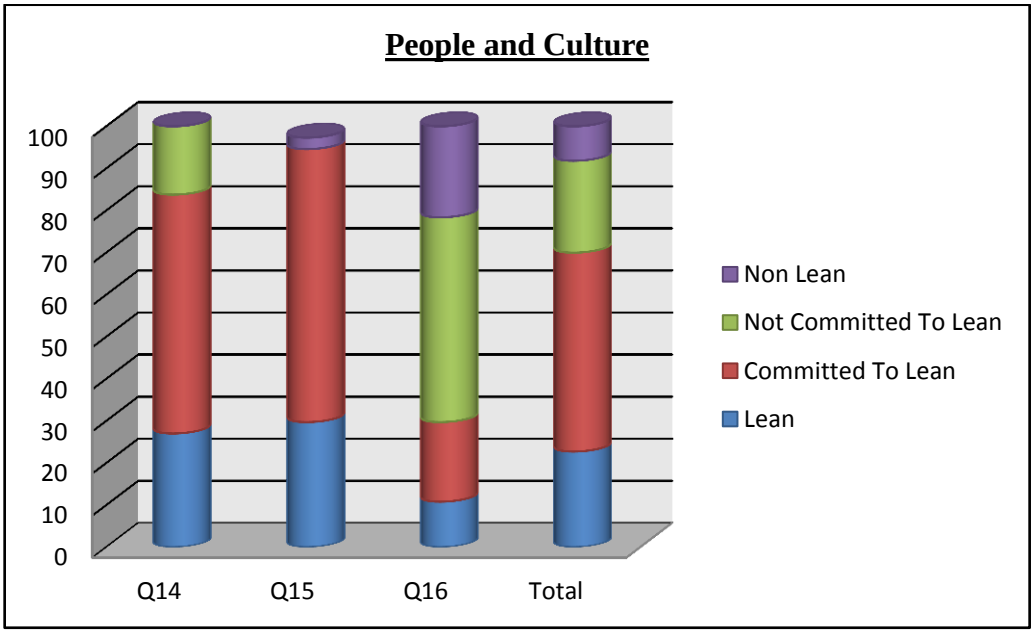


Figure 9: People and Culture (Questions 14 to 16)

The people and culture section intended to establish the extent to which organisations involve employees within the management teams to suggest both ideas and improvements to minimise waste and if incentive schemes are used in conjunction with this process.

Question 14 reveals that 56.76% of organisations are partly committed to lean, allowing employees to be involved with the management teams suggesting both ideas and necessary improvements, as opposed with just 27.03% who operate totally lean.

Question 15 moved on to ask if organisations adopt a multi-disciplinary method in regard to project delivery, 64.86% of respondents stated their organisation was committed to lean with 29.73% of those participants being fully committed to a lean way of functioning. Interestingly though only 29.73% of that higher scale acknowledged to promoting incentive schemes to those employees suggesting change, in contrast to 70.27% who stated their organisation had no incentive schemes in place for those employees suggesting a new or improved way of working. This clearly shows although incentive schemes may work there is no connection between those companies who claim to be lean and incentives.

Over the three questions asked within the people and culture section 70% of all respondents claimed to be committed and are currently implementing lean policies, in comparison with question 2 those claiming to be lean was 64.87%, this analysis suggests that no direct correlation exists between those establishments claiming to be lean and those actually implementing a lean human resource policy.

Project Delivery

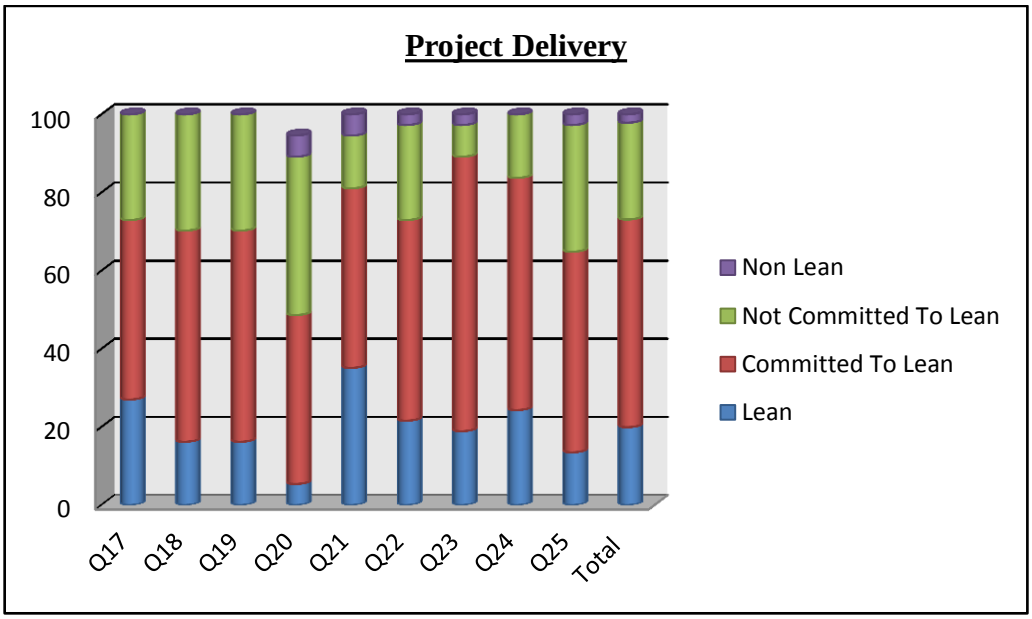


Figure 10: Project Delivery (Questions 17 to 25)

This particular section was primarily focused on project delivery establishing whether lean policies are being implemented throughout the project level around the construction industry.

Question 17 asked if the company is committed to value stream management, for example process, mapping, identifying and reducing waste and figures show positive results with 72.98% either committed to lean or completely lean, with 27.03% not committed to lean. Upon comparison with the results of Ledger (2004) it is evident that there is a significant improvement leaning towards a lean philosophy as his figures demonstrates only 37% of his respondents were either committed to or

completely lean, this demonstrates a positive attitude within the industry over the last eight years.

Question 19 shows that 70.27% of organisations to date utilise a project logistics plan helping monitor waste, with 29.73% of the respondents not committed to lean or observing waste.

Questions 20 to 23 were focused on establishing organisations current practice, including the extent in which the principles and tools from 'Last Planner' are being applied. Question 20 shows that 48.65% of the organisations that responded aim to ensure work assignments are not committed sooner than required implementing a pull planning system, and 45.95% applying the traditional method of push planning techniques with 5.40% avoiding the question all together, perhaps signifying a lack of understanding.

Question 21 again shows positive results in terms of moving towards lean, when asked if all activities are mapped out using current planning techniques 35.14% stated they are completely lean with a large proportion (45.95%) confirming they are committed to lean. These figures demonstrate that the UK construction industry are moving away from current planning techniques that cover critical path models (CPM) and swaying towards the planning techniques that cover mapping out of all activities on the master programme covering the likes of inspections, moving around and waiting.

Question 22 moves on to weekly work plans and figures show 21.62% are lean and use these plans on a regular basis with 51.35% partially using them: additionally Question 23 proves that 89.19% aim to act upon any delays or problems that arise during planned assignments throughout the project.

Although the project delivery section shows positive results it is also evident there is still room for improvement within the UK construction industry aiming towards a lean ethos as Question 25 highlights that only a small proportion of these respondents (13.51%) are currently lean implementing the JIT approach, with 48.65% moving towards lean, and 35.03% are either not committed to lean or non-lean.

Continual Improvement

The final set of closed questions focuses in detail on continual improvement as these play a significant part in becoming and maintaining lean, moving towards better practice. Overall 22.16% of organisations are lean and aim to continually improve within their business, 48.65% show commitment towards lean with 27.03% are not committed to lean.

Results from Question 26 reiterate the fact that 43.24% of organisations do not encourage or reward employees on a regular basis to improve their work practices.

Whereas Question 28 asked organisations whether or not benchmarks are utilised and shared with competitors or suppliers to endorse incremental process enhancements to

either systems or sub-systems, and figures demonstrate that 43.25% do not utilise this method of approach with only 18.92% fully committed to lean.

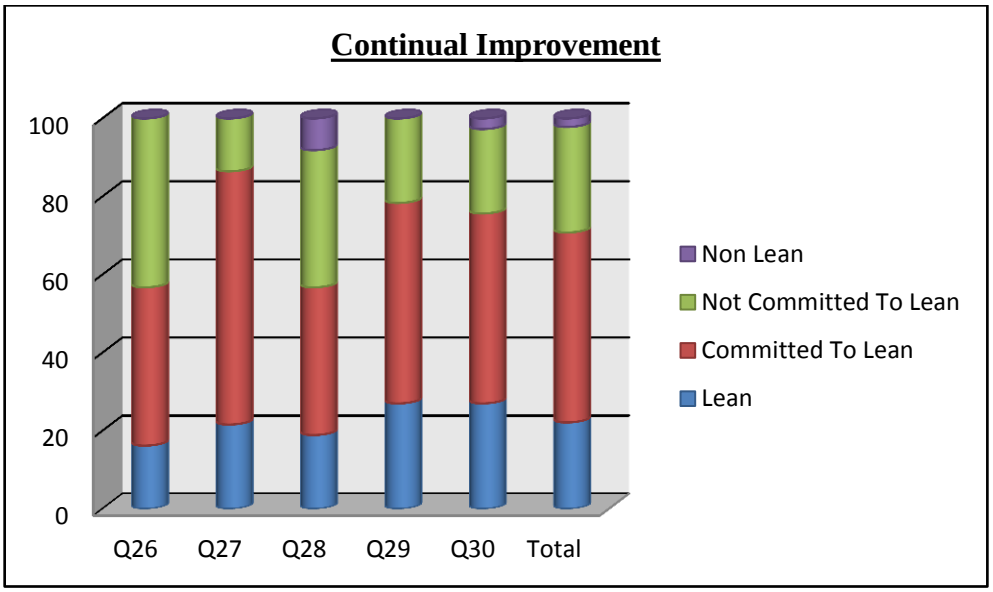


Figure 11: Continual Improvement (Questions 26 to 30)

Lean Organisations and Turnover

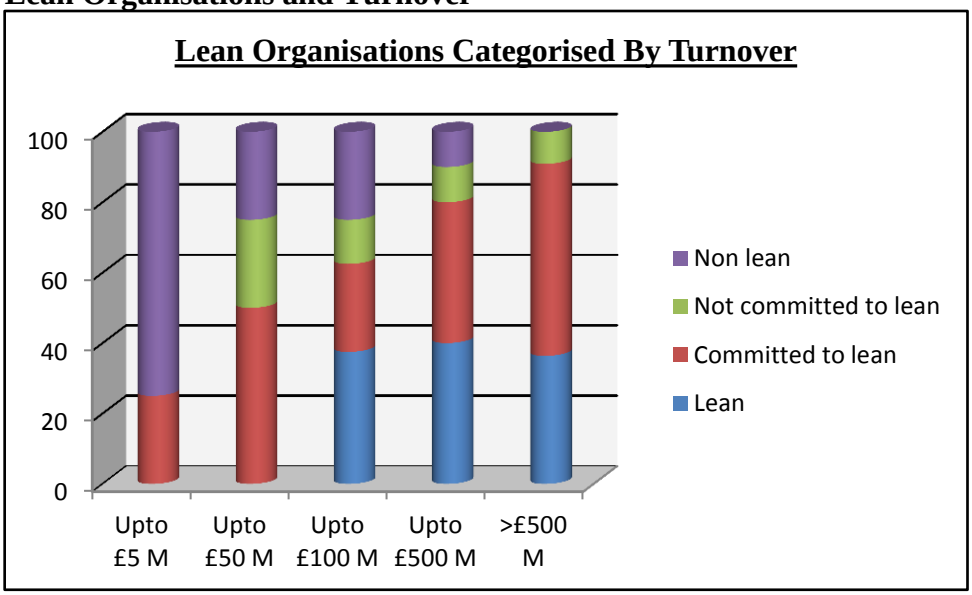


Figure 12: Lean Organisations Categorised by Turnover

Upon analysing all the data received, the respondents were categorised via their organisations overall turnover allowing a comparison to be made from non-lean to lean via each organisations turnover.

Looking at Figure 12 above it clearly identifies that generally as an organisations overall turnover increases so does the level of commitment towards lean, possibly suggested that those organisations with less turnover have less of an understanding or the associated resources required to allocate towards a lean philosophy.

DISCUSSION

Study for this dissertation has demonstrated that lean construction has a beneficial impact in the way an organisation operates throughout the lifespan of a construction project.

Previous studies were undertaken regarding lean construction in the 1990's by several authors covering Emmerson (1962); Banwell (1964); Latham (1994); and Egan (1998) and show that the construction industry has been relatively slow in adopting these principles and this dissertation has highlighted the fact lean construction is the future and the importance it plays as a significant factor in improving planning, distinguishing problems before they arise on site with relevant solutions being adopted.

The questionnaires had a high (66.67%) response rate overall, attributed somewhat to the production of this on bright yellow paper ensuring easy return by enclosing a pre-paid envelope. Interviews proved to be slightly harder to organise but with the relevant polite reminders sent were successfully completed.

Summarised below are the fundamental findings discovered from the primary research:-

- Not all the UK construction organisations that participated within the primary research fully understand the term 'lean'.
- The understanding and implementation or rationale behind lean construction differs between organisations.
- Lean is generally applied more in the higher turnover businesses.
- It is clear that businesses who are claiming to be lean, do actually apply lean policies to a greater extent than those businesses who claim to be non-lean.
- Evidence demonstrates the smaller businesses show less of an understanding of the theory behind lean construction.
- The obstacles to lean that arose are easily overcome, covering procurement methods, lack of understanding, training and cost implications.
- Concluding the findings, the majority of the participants that took part in the study of lean construction highlighted they feel lean construction is beneficial and maybe the overall solution to improve efficiency.

CONCLUSIONS

The primary aim of this study was to establish if both techniques and principles of lean production which is hugely prominent in the manufacturing sector is a probable solution for successful efficiency within the construction industry.

The evidence clearly suggests that the construction industry to some extent is developing from the manufacturing process. The two sectors in question both have resemblances from all levels.

The size of the organisation will determine the likelihood and extent to which lean philosophy is implemented. The larger and well known UK organisations proved to be leaner and provided in depth answers to the open questions demonstrating an understanding whereas the smaller construction organisations give minimal answers if any. Nevertheless the smaller organisations did prove to be leaner than actually expected, although lack of understanding does still persist.

Numerous respondents highlighted their belief towards the benefits lean philosophies have to offer and how implementing lean can benefit their organisation. This possibly suggests that the UK construction industry have seen the Egan report and understand to improve their organisation within the industry lean is the way forward, although the solution can be seen in organisations which choose not to fully implement throughout their organisation, perhaps due to a lack of understand of lean as the potential barriers were all too common and easily overcome. Identified barriers such as adequate training will allow an organisation to create and tailor a lean philosophy unique to their organisation, however it is clear that selected organisations see slight inclines of the system not fully working and revert back to simple traditional methods.

Evidence clearly suggests that lean policies are actually being applied, with signs of improvement needed to improve planning strategies. On the other hand it is exceptionally problematic in establishing whether some of these implications used to gain success were particular in the use of lean or certain situations where they needed to be incorporated.

Undeniably the term lean construction varied in understanding between each organisation that participated in this study, this understandably advocates that the work concerning lean construction is far from accomplished to date therefore can be concluded, to improve efficiency within the construction industry lean production is a probable resolution.

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HUMANS AND CHANGE: KNOWING WHO YOU ARE LEADING

John W. Ambler

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This article examines theories of individual character development and motivation in an attempt to understand why employees often resist change. It then suggests how through the insights of theory, a more collaborative and consensual leadership style might be developed. The article draws together the work of Maslow and Erikson and recent work upon 'emotional intelligence'. It seeks to show how re-engineering work processes in the construction and engineering sector might lead to a greater 'buy-in' for change, if the need for that change could be better articulated, and more closely aligned by the manager to each individual's self-perceived 'needs' and motivations for their work. The article outlines two attempts by the author to apply his ideas to real-life construction site management situations. First, an attempt by the author to delve into the biographical influences upon the development of needs and motivations within a sample of his employees, and second, the trial of a revised – and more collaborative – approach to construction site induction.

Keywords: change, construction management, emotional intelligence, goals, leadership, motivation, needs, personality, site inductions.

INTRODUCTION

In this article I examine how theories of human behaviour and motivation can provide an understanding of why different individuals react to change in the diverse ways they do. I believe that managers will become better agents for change (and more effective communicators of change processes) if they can come to appreciate the insights of theories of personal development and work-place motivation.

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My core argument is that each individual needs to be shown the relevance and personal benefit of a change before they will fully embrace it. If a manager can come to understand the factors shaping how individual employees orientate to their work identities, they will have a better ability to manage their teams through periods of change. I have seen the organisation I work for change over the past nine years with the introduction of new processes in the forms of procedures and rules born from environmental pressures such as changing economic climates, the invention of new building processes and partnership arrangements for contracts. Construction companies have had to adapt their traits in order to stay competitive in their quest for growth and survival. In starting to reflect upon this I was struck by how this adaptive process of survival appeared to echo evolutionary theory, as originated by Charles Darwin. Yet in my job I have observed that individuals are resistant to changing their ways in order to fall in line with new processes. Therefore my study set out to investigate why individuals may be resistant to change, even when the organisational necessity for it is patently obvious.

Upon starting to read into research upon, and theories about, organisational and human behaviour in situations of change it quickly became clear that I had set myself a rather wide field to survey. It was therefore necessary for me to be selective, and the reader should appreciate that as this article is the result of exploratory excursions into 'virgin territory', the findings cannot be taken to be a definitive statement of the fields that I briefly peered into. However, I would hope that what follows highlights that even at undergraduate level, enquiry can be profitably followed into unfamiliar areas, and helpful contributions found there to feed back into the work of management practice. I say this having survived this journey with the guiding hand of my dissertation supervisor and his frequent wise words to me "John, yes I like your idea there, but you are never going to master all the studies and scholarship in that field. You need to keep your project anchored at a feasible scale". What follows then is a sketch of a topic area which I feel cries out for further study and empirical investigation. However, even at the modest level of my own enquiry, I have found direct practical benefit from my findings, my daily on-site practice as a manager has changed through application of some of the insights that I have acquired through my study.

How to add individuals back into studies of change management

Organisations are people led, therefore, the study of human behaviour is a key factor in organisational studies. By understanding human behaviour in individuals it may be possible to increase the efficiency of an organisation, especially within times of demanding environmental changes. Yet my review of the existing literature suggested that the human factor has tended to be treated as marginal within studies of change management. Over the past 25 – 30 years, organisations have re-shaped old processes of management that were considered to be restricted to 'top down' measures (Wong, 2007, page 11). Wong states that these processes were considered to be 'militaristic', and restricted the opportunities of the employees to be creative and to make decisions based on their own judgement. But I would argue that this more traditional form of

management still tends to persist within the construction and engineering sector, which is the reason why conflict appears still to be the endemic reaction when it comes to managing change. Too often the approach remains one of a drive to 'standardise behaviours and shape people to fit processes' Wong (2007, page 11).

The focus in studies of change has been upon organisations and their management of change. It has been considered that 'change research gives short shrift to people who implement and live with organisational changes they did not initiate', and to the extent that they appear at all in reported research, the 'experiences of these change recipients are often cast as resistance', (Balogun and Johnson et al, 2004 cited in Bartunek et al, 2006 Page 183). The literature gives little attention to the role of individual character traits in affecting an individual's attitudes towards development and motivation. I found through the literature that evolution theories were relevant to understanding why change happens and that evolution theories can also be used to understand why, through change, we (as individuals) demonstrate certain traits that are used to ensure we adapt to change. Evolution is best explained in the work of Charles Darwin (1859). As discussed in the research of Gontier (2010), Darwin believed evolution to be a process of change in which organisms (in this instance organisations/individuals) display certain traits (personalities) in order to survive. This was summarised best in his 'survival of the fittest' theory in which Darwin explains, 'species survive in particular environments because they have characteristics that fit with, or adapted to, their surroundings', (quoted in Berk, 2010, page 11). Another explanation for this may be David Kolb (1984)'s view (cited in Williams et al, 2002, page 21) that 'when we enter new situations or meet new people, we find our expectations are not met and we are stopped short', and in that process of being 'stopped short' we have to adjust our postions in order to cope in the environment in which we find ourselves. In the following sections I will consider how personality theorists have interpreted how individuals react to this realisation that they must adapt to the situation that they are in, and specifically how motivation, and the implementation of change, can be structured so as to fit within individuals' likely attempts to make sense of, and adjust to, new situations facing them.

Darwin believed that organisms would be required to adopt certain traits in order to be successful in an ever changing environment. The traits Darwin expressed were 'adaptive, maladaptive or variation', (Darwin quoted in Gontier, 2010, page 78). Gontier (2010) discusses Darwin's beliefs, that the adoption of traits takes place during reproduction, as it is the passing of genes via a process of natural selection to cope with the demands of a changing environment which determines which trait would be fit for survival or perish. Organisations have used this form of thinking for some time as Davis, (1996, page 539) discusses, when he notes that a 'familiar brand of Darwinism thinking' could be found in 'economics' where 'competition or other selection pressures ensure that inappropriate types of firms are selected out, through bankruptcy, takeover, or some other means'. I believe people acquire many traits as a result of their life experiences, but they actively choose which to make dominant in their daily lives on the basis of their assessment of the environment that they find

themselves in. Individuals adopt strategies that to them seem best suited to maximise their chance of survival within the situation facing them. In other words, we cope with change by the adaption of our traits and this adaptation is driven by learned processes or events. Kolb (1984, cited in Williams et al, 2002, page 20) calls this 'the process whereby knowledge is created through the transformation of experience,'

Motivation: why is it important?

I found, through the literature review, that human motivation theories are best suited for understanding how individuals can be encouraged to effectively participate in the evolution of their organisations. Wong (2007) discusses in depth throughout his book. I found that motivation was a key human behavioural process which can be used to explain efficiency within an organisation through its people. Sadri and Bowen (2011), page 45 argue that 'motivated employees work harder, produce higher quality and greater quantities of work, are more likely to engage in organisational citizenship behaviours, and are less likely to leave the organisation in search of more fulfilling opportunities'. Sadri and Bowen's approach can be developed by adding Vroom's (1964) 'expectancy theory'. Vroom believed 'felt needs cause human behaviour', and that 'motivated behaviour in a work setting is increased if a person perceives a positive relationship between effort and performance' (Vroom cited in Hersey et al, 2008, page 27). The above claim and theory epitomises the literature surrounding human behaviour. By looking at motivation it leads me on to a vast number of different theories which exist to determine how motivation is identified and perceived within an organisational environment, but I believe this theory to be much more grounded, for we are always motivated by what we wish to achieve. Naoum (2001, page 230) identified two theories of motivation, both of which are relevant to my study :

- 'Content theories of motivation (also known as need theories)'and
- 'Process theories (also known as goal theories)'

Naoum's 'goal theory' aligns with Vroom's 'expectancy theory' . He also links this to a renowned theory founded by Abraham Maslow in 1943, the 'hierarchy of needs theory'. All of these theories bear a similarity to one another. This is also demonstrated by Armstrong's (2008, page 223) perception of motivation theory, as he cites, 'behaviour is motivated by unsatisfied needs'. Although theoretical discussion of motivation has often focussed upon discussion of 'what motivates', Naoum (2001, page 230) points out that it also helpfully (and more practically) points towards 'how to motivate'.

Goals and motivation

When looking at tools to understand how to motivate, the 'goal theory' is best placed to satisfy this, as Armstrong (2008, page 223) believes, 'motivation will be increased if goal setting techniques are used'. However, this poses the question of how externally imposed goals can be aligned with an individual's own perception of his own needs. An imposed goal will only motivate an employee to embrace change (or otherwise act) if that employee feels the goal to be relevant to their needs. These

needs will be framed by the individual through his selection of 'appropriate' dominant traits, traits that seem best suited to the situation he is faced with, according to his understanding of that situation. This need for a 'fit' between the individual and the organisation is commonly called 'by-in', and is the meeting of minds sought in a range of organisational processes like change management, dispute resolution and staff appraisal. Another problem with measuring motivation with goals is that the 'final goal is often set and the person is judged only in terms of success in reaching that final goal', (Hersey et al(2008) page 26). This would not present a true account of an individual as it would not consider whether that person has reached the need they intended to satisfy, therefore achieving their personal goal. Hersey et al (2008) make valid claims towards the goal theory in noting how it is an important tool used within an organisational environment. Setting goals with the opportunity of rewards is an important way for managers and organisations to increase motivation. Armstrong (2008, page 107) states that this can be by the use of financial gain as 'money is important to people because it is instrumental in satisfying a number of needs'. I choose this quote from Armstrong as I believe money within organisations to be the key driver behind motivation. Recognition, responsibility, influence and personal growth are secondary motivators, and their strengh (i.e. significance as a motivating factor for any particular individual) will depend upon the individual's dominant traits, and the needs that they are choosing to acknowledge and pursue.

Needs and motivation

When looking at what the underlying cause is for motivation the need theory seems to be an accepted philosophy used by authors in understanding people's behaviours. This theory has numerous approaches applied to it by authors such as Naoum (2001), Hersey et al (2008) and Armstrong (2008). However, it is Abraham Maslow's theory which seems to be the most accepted. Figure 1 defines Abraham Maslow's hierarchy of needs. Maslow presented the physiological need as the one we look to satisfy when we are driven by the need to feed, clothe and shelter ourselves. The next need on the hierarchy is safety. This need is satisfied by seeking 'stability, security, and freedom from fear and anxiety' (Schultz and Schultz, 2005, page 305). Social needs are next in the hierarchy. Schultz and Schultz (2005, page 306) states that 'these needs can be expressed through a close relationship with a friend, lover, or mate, or through social relationships formed within a group'.. The esteem need, and as Schultz and Schultz (2005, page 306) discuss, concerns indivudual's need for 'esteem and respect from ourselves, in the form of feelings of self worth, and from other people, in the form of status, recognition, or social success'.

Hersey et al (2008, page 30) follow Maslow's approach by stating, 'behaviour of individuals at a particular moment is usually determined by their strongest need'. This is contrary to what McGregor (1957) cited in (Hersey et al, 2008 page 49) believes, as he argues that 'motivation occurs only at the physiological and security levels'. However, I believe that motivation occurs periodically through various stages, as it is our life circumstances through environmental forces that force us to act in certain

ways (taking into account within that the ability of individuals to adapt their traits (and their perception of their needs) to best fit the prevailing circumstances).

Figure 1 Maslow's hierarchy of needs 6 stages (Sadri and Bowen, 2011, Page 45)

How are needs and goals developed?

To form a coherent approach I explored Erik Erikson's eight life crises theory to challenge McGregor's (1957) claims. I chose to use Erikson, not to display each stage he portrays, but to highlight possible links that can be drawn to Maslow's hierarchy of needs theory. Erikson does not portray how development takes place nor does he focus directly upon what our needs are. He does not explain what experiences people must obtain in order to develop and deal with psychosocial conflict and how this influences personalities. If Erikson had used Maslow's theories he may have been able to deal with this. I believe that it would have then been possible to establish what is important at what stage of an individual's life to understand what need they are looking to satisfy in order to move to the next development stage. Although I believe that very little reliable study or evidence exists when looking at the links between Maslow and Erikson, I tentatively explored these links within my study. I started to form questions as to how we prioritise our needs that Maslow identifies in order to move to the next level of needs. I believe this is what Erikson is trying to present

through his theory as he discusses how we overcome each crises in order to, 'prepare for a satisfactory resolution of the next life crises' (Schaffer and Kipp, 2007, page 50).

Applying these theories to organisational life

I believe Maslow's and Erikson's theories express our adaptive nature, an important trait when used in the realms of changing environments. I found these theories important in order to understand what others have written when discussing the problems that have been faced when trying to integrate individuals into organisational processes and rules. I found that my thinking was best explained by Wong (2007) when he gives an explanation of the challenges projects face when looking to achieve a balance that is successful. Wong (2007, page 15) states that a 'project's objectives need to align to processes, but they also need to align to people if projects are to be planned and executed successfully'. The statement from Wong demonstrates a similarity to what Naoum (2001, page 228) tries to express when he highlights the importance of pin-pointing people's needs and background and of its positive 'consequence on job satisfaction and productivity'. Interestingly Wong (2007, page 15) points out that for organisations to do this, organisations must value their employees for 'who they are, respecting the diversity of their backgrounds, cultures and experiences'. This statement from Wong helped shape the managerial approach that I have adopted within the pilot study within this research. Although Wong (2007), Naoum (2001) and Armstrong (2008) recognise that people are key towards achieving success, and that motivation can be increased through satisfying needs and setting goals, they rarely identify how to understand the stance of an individual or how to identify their the key needs in order to motivate them. Naoum (2001, page 230) does come close to this when he states 'these motivating issues are concerned with identifying peoples needs and their relative strengths, and the goals they pursue to satisfy these needs.' Although Naoum makes this statement it is not discussed in depth as to what those needs or strengths may be.

Some literature points out that evolutionary psychology may assist us in the midst of these questions as Nicholson (2000, page i) states 'Evolutionary Psychology shows a new way forward, through a science – based approach, built upon a great and growing convergence of evidence from many disciplines.' The problem with this as Nicholson (1997, page 1054) explains that theorists and scholars, 'have been much more accustomed to perceiving and working within the boundaries of our disciplines', thus meaning that there are a number of stand alone theories which all bear some resemblance in the path of their own thinking. However, these theories rarely offer a complete correspondence to one another, Maslow and Erikson being an example of this. One of the other criticisms of evolutionary psychology is that its beliefs are that our traits are hereditary, passed on through reproduction. This is one way of thinking which I reject as I believe that our psychological features are developed through experiences from relevant events and very basic needs. This way of thinking represents a nurture over nature approach.

A nurture based approach to developing motivation

I believe that our traits are established from learning that takes place through our life, learning that has come from our acts when trying to satisfy our development and our needs. Our acts are rationalised by our behaviour and I have found through the literature that our behaviour is driven by motivation, the whole process I believe to be a nurture approach. David Kolb (1984) provides a working definition which displays a nurture approach. Kolb (1984) quoted from Williams et al (2002 page, 20) this working definition in the following order.

- Concrete experience
- Reflexive observation
- Abstract conceptualization
- Active experimentation

I believe this to be relevant to how we categorise our motivational needs, one which I have found to explain the drive of our cognitive instincts. The general thinking of Kolb (1984) is that by gaining experiences we can reflect upon them, gaining and forming ideas from the results of our reflexive thinking: modelling in our minds how particular strategies might work out for us.

Where do theories fit into managerial and leadership processes?

Reflecting on the vast array of managerial literature and processes available to develop leaders and prepare them to have the skills to motivate and get the best out of people, Nicholson (2000, page i) reminds us that although we as individuals have a complex mind, on the grand scheme we have simple needs, he states 'it is time to get back to reality. We may have taken ourselves out of the Stone Age, but we haven't taken the Stone Age out of ourselves'. No matter how complex or structured our environment seems to be, we as individuals are very basic in what we look to achieve: 'The living entity has free choice to act properly or improperly and receives the resultant good and bad reactions in terms of success and failure, happiness and distress', (Ranagantham,no date). I believe that all the theorists discussed above have contributed greatly to the development of understanding of human behaviour and motivation, however, in my opinion, many of these commentators have, at times, been short sighted by being too focused on trying to explain our complicated mind rather than our simple needs.

Studying needs within change management

Following my literature review I devised a small, work-based research project in which I could apply and explore what I had come to understand about theories of human behaviour and motivation in the practical context of day to day construction site management. Within this project I interviewed four work-site colleagues, representing a range of roles, in order to understand how their personality traits and specifically their attitude towards change, had developed across their life course. My aim was to see whether those biographies would reveal links between Maslow's hierarchy of needs theory and Erikson' life development theory. I also utilised an

‘observe and reflect’ methodology to critically examine a work based managerial situation with which I was very familiar: site induction. Site inductions are an important part of a project as they deliver information to new starters during their first day on site which is in line with the policies, procedures and rules of the business unit and organisation. These procedures, policies and rules form the environment to which we must all adhere during our time on the project.

I delivered these inductions by giving a presentation with the aid of power point slides in order to relay the information to the new starters. These slides were developed in a standard format and sequence in order to ensure the information was delivered clearly and concisely so that all the key information was given without question. Following the reading of the slides I ensured that all individuals read their method statements and signed the necessary documentation before allowing them to work on site in the hope that they followed what I had delivered to them in the induction whilst maintaining the obligations within their method statement. After the inductions I watched workers on site and stated to form questions that appeared to arise each time I undertook my post-Induction observation: ‘why has that guy not cleaned up after himself?’ and ‘why is that guy not doing what we expect and what his method statement told him to do?’. I found myself judging my own contribution to this situation and asking myself ‘did I mention that in the induction?’ and ‘was I clear when explaining what our standards are and our expectations?’ I felt sure that in each case the answer to my anxious question was ‘yes’.

As my understanding of this scenario was limited I would challenge individuals as I had seen managers do before me and start dictating to them in the form of instructing them to rectify the situation. This brought me a great deal of frustration as I often found myself in conflict situations as I simply did not understanding why individuals were behaving in the way they did even after my thorough induction presentation. I saw also that other managers were spending a vast amount of time micro-managing individuals rather than carrying out the their own important duties. When I asked the individuals why they did the things that I had observed, I always got the same set of answers which were, ‘I have always done things this way’, ‘I am on a price, therefore, my way is quicker’, ‘my way is safer’, ‘you get a better job this way’. In the scheme of things the opinions of the individuals were telling me that they were in line with what we were trying to achieve as a project and business unit, which made me think, ‘why the conflict between the two?’

Reflecting on my literature review it became apparent that the induction process was striving to standardise individuals’ behaviour to fit organisational processes. Yet this standardisation was failing because managers had rarely stopped to understand the motivations of the workers they were tasking and inducting. Wong (2007), points out that an individual’s understanding of who he is and thereby how he should behave is a product of his background, and expectations associated with his role (in construction, often the traditions and customs of his ‘trade’). To understand an individual’s goals we must understand what they individually want to achieve from the situation they find themselves in. In other words, what is it that matters to them: an eight hour

working shift, payment in accordance with a piece-rate or a desire to get home in time to do something of more interest to them after work?

Whilst accepting that a manager will rarely have sufficient time to get to know his staff (and their individual motivational drivers) intimately, I believe that attempting to spot general themes and types will at least help managers to target their motivational messages so that they align to the workers' inherent motivations and self-perception of their needs. The interviews that I undertook sought to understand the interviewee's traits in the context of their biography, and to test out my own surface level assumptions about these members of staff (the level at which I would normally be making action-influencing assumptions about what makes them 'tick'). Throughout the first half of the interviews I asked the participants personal questions such as 'what their childhood was like?', and 'what they were like as a person growing up from adolescence through to their teens?' I then went on to ask individuals 'what their interests and hobbies were?' and 'why they chose the industry they currently work in for a career?' My reasoning for these questions was to see if the development of that individual demonstrated at an early stage possible needs they looked to satisfy from the situational they found themselves in at that current time. From this I felt it was possible to identify current traits that had been developed, which presented the same need that the earlier traits had looked to satisfy. To do this I used the concept of change throughout the interviews, so I could understand how change makes that person feel. Through my own experiences I have found change to be a good way of measuring the fluctuation of an individual's motivational pattern. I had hoped by using this method to show how that individual is motivated by a need which they desired to satisfy. My thinking behind this method came from Armstrong (2008, page 223) who states 'behaviour is motivated by unsatisfied needs'.

As I used the life development process through the first half of the interviews, I channelled my thought process towards attempting to align Erik Erikson's developmental theory to Maslow's hierarchy of needs. Erikson believed that we as individuals 'face eight major crises in our lives, which he labels the psychosocial stages'. (Schaffer and Kipp, 2007, page 50). Each stage represents our development and categorises what is important to us at each stage of our lives. Erikson groups our age to identify what we are looking to achieve in the context of development, for example, he identifies that stage 7 (crisis 7) is where we try to express ourselves in the form of 'propriate striving' (Schultz and Schultz, 2009, page 251), we do this to ensure that ones biological needs for survival are met. Both sets of informants demonstrate that in certain stages of their lives certain aspects were important to them in order to aid their development. I believe it is because of this, needs which they look to satisfy are paraded. What is apparent through the analysis of the data is that those needs never leave the individual. The only interpretation I can draw from this is that it seems the individual has progressed successfully through how Erikson's theory discusses they see their needs to how Maslow categorises them best placed to be in order to see them through the next developmental stage.

Here I will summarise one interview, in order to illustrate my approach. 'Mike' (not his real name) was a bricklayer and was in his middle forties. He demonstrated a much simpler need than the two interviewees before him, but once again it was his earlier childhood that built his trait which presented him as a hard worker who does not look for recognition from peers. He expressed his childhood to be good 'always messing about at school' which symbolised that he liked to be a member of a group and that he enjoys having that sense of a social belonging. He demonstrated this need when he gave a reason for choosing his profession; he stated that he chose bricklaying because 'he liked watching Auf Wiedersehen Pet [a TV show] as he thought it was a laugh'. However, the social need was not the main need the interviewee strived to satisfy, as he explained 'his dad died when was fifteen years old' and his 'mam made him go out to work' as money was tight. Because of this he described himself as 'being a grafter'. He discussed money being important to him which is one of the other reasons he chose his profession as he states 'bricklayers were on good money'. My observations through this interview were that Mike was motivated solely through monetary reward and it seemed to be the case that money was the only need that he was seeking to fulfil through his employment. I asked him 'how do you feel when asked to change' to which he replied, 'I would go along with it, but I would ask the benefit of it'. Mike stated that he just 'likes to do things his way'. When he was asked whether he looks to push changes, he indicated that in certain situations he would – but only where it benefited him via means of a financial reward. I asked Mike where he saw himself in the next five years to which he replied 'see myself well if things pick up'. He was talking about the current economic situation the industry faces, as jobs are few and far between. Mike's alignment to the organisation he currently works in appeared purely instrumental, a means of acquiring money. This attitude may have come from his father dying and subsequently being forced to go to work so he could contribute to his family's simple needs such as clothes and shelter.

Other interviewees revealed their dominant motivations to be a need for social contact, status or mental stimulation. Professional post holders tended to have non-pecuniary motivation (or at least factors such as status were present alongside a concern with earning money). Interviewees demonstrated different orientations to change dependent upon what they saw as the reason for their being at work, and whether any particular change might further (or work against) achievement of their specific (self-defined) needs.

Acknowledging emotional intelligence

Because of the experiences I have gained in the industry over the last nine years, I saw ways I could test the findings due to how I understood individuals needs and how these could be used to motivate their behaviour. Through my learning I fully accept that individuals behave in a way that suits a need, and that individuals, to an extent, select which needs to promote in any particular situation. I believe it is by being aware of that need that it may be possible to increase their motivation in ways that suits both project processes and the individual themselves. The theory I identified to be best placed to do this was emotional intelligence. In his analysis of the role of

character traits and how these are linked into effective leadership, Naoum (2001) drew upon Seligman's (1992) work on emotional intelligence, and his argument that emotional intelligence is insufficiently valued as a leadership quality. Emotional intelligence is a relatively new theory, that looks at the power of leadership messages that manage to 'articulate a message that resonates with their followers emotional reality'(Daniel Goleman quoted in Bernhut (2002, pg14)). I believe that the key to finding a way to bring the insights of Maslow and Erikson into the effective day-to-day management of change is to encourage managers to focus on the importance of being aware of their staff's individual motivational needs and thus the practical value to be gained by managers in attuning themselves to the emotional reality of their individual staff members, and making the effort to show that the organisational goals outlined in induction and change briefings are consistent with the individual's pursuit of their own dominant needs.

Applying theory to practice: a different approach to site inductions

I have now adopted this emotional intelligence approach for subsequent site inductions. I now run them as focus groups rather than as a 'top-down' power-point and form-filling based instructional briefing. In this new approach I ask the individuals why they have came to work today. The instinctive answer I receive is 'to earn money'. I then follow up by asking 'So is it that you seek to earn money so you can feed cloth and shelter yourselves and your family, or even to go out and socialise on a weekend?' The general answer to this is a nod, even a laugh; but always a 'yes'. I find that because of these simple questions I attract the attention of the individuals listening to me from the outset. Their faces are focused on what I am saying. This is not something I have experienced before as usually through inductions individuals would look dazed, fiddle a lot and even sleep.

I then explain that I know exactly why they are at work and that I want no other than for them to satisfy their needs. Although I then explain I too have needs and that I need them to help me to fulfil them. It is at this point that I start introducing the organisational processes that are a part of the project. However, I do this in a different way than I would have done in the past. I briefly explain, rather than deliver my message in a methodical and militaristic manner, that we want the site to be tidy, safe with a good flow of communication. I explain that we are looking for all individuals involved to demonstrate accountability for what they are doing which in turn would take care of the organisational processes and rules. I explain that for them to do this I will need them to simply to tidy up during and after the shift and use the correct safety equipment. I explain to them that by valuing themselves as professionals they should know what it is they should use and when to use it.

The message I am was trying to get across in this new approach is that I believe the individuals to be the specialists and that I am simply there to manage a process, whilst satisfying my own needs in life. By doing this I want the individuals to view me as being on the same level to them. I want them to perceive me as someone who they can trust, because I understand their needs, how the site can run smoothly so that they can

do their job, earn their money and go home happy. At the end of inductions delivered in this new style I have asked the group what they think of this approach. The feedback I have received is positive and on more than one occasion individuals have stated that it was rare to be included in management processes like this where their opinions and trust were heavily relied upon. Some of the individuals have stated that they would usually be told to 'do this' and told to 'do that', not consulted and to be made to feel a part of what was happening. The signs are there that this new induction style is working. The site itself is immaculately tidy and we are receiving positive recognition from the business unit for our success to date. I am yet to engage in conflict with any of the supervisors or staff, and the individual's onsite demonstrate an excellent level of respect for each other and the project itself. The individuals are motivated in ensuring the site standards are adhered to and in some ways are demonstrating a sense of ownership for the working environment.

Conclusion

The construction and engineering sector would benefit from greater focus upon theories of human development and motivation. This sector suffers from particularly extreme cyclical fortunes, and ensuing structural, organisation and individual-impacting change. A greater focus upon understanding human behaviour in the face of change, and the role of an individual's development and motivational 'needs' within resistance or acceptance of change would help managers to lead and motivate employees through periods of necessary change. It is clear that strong links exist through many theories of human behaviour through times of change. By understanding the principle of evolution and why change happens, it is possible to take human character trait and development theories and combine these with motivation theories and witness practical benefits in the workplace. However, past theorists working within a wide range of fields (management, psychology, evolutionary biology) have rarely looked outside of their own discipline in order to benefit from what other disciplines could have offered. The developing field of 'emotional intelligence' provides a promising opportunity to join the 'theory and practice' together for fruitful gain in the construction and engineering sector, and it is certainly an area that would merit further research.

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