COLLABORATIVE BEHAVIOURS DRIVING EFFECTIVE INNOVATION: AN EXPLORATORY STUDY (25)

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"The road to successful innovation is paved with information technology"
[Forbes Insights, 2014]

Abstract

This paper focuses on an imaginative internship programme, named Extreme Blue[®]*, which has been introduced by IBM*[®] *to help them identify high potential, future graduate level recruits, by getting teams of internees to work together on practical computing projects, for some of IBM's key collaborative partners and potential customers*[1] *. The research team were given full access to the* Extreme Blue *participants, and they used a qualitative research approach, based upon interviews, observations and document reviews, to investigate the nature and effectiveness of the software development approaches that were adopted. The key finding was that the* Extreme Blue *initiative enabled groups of inexperienced, undergraduate internees, to be melded into effective software development teams, in a very short period of time. Moreover, this exploratory study makes a potentially important contribution to the software development literature by providing important new insights regarding an approach, which can deliver timely and effective software solutions, which are both innovative and have the potential to deliver real business value. The study also makes a potential contribution to the developing literature on graduate recruitment in the IS sphere, by answering the question: how can organisations improve their ability to identify and attract the very best graduate, to be employed in technically-oriented roles?*

Keywords: Information Technology, Innovation, Business Value; IBM; Graduate Recruitment.

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[1]   *IBM, Extreme Blue, and Bluemix are trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide.*

1.0   Introduction

In an increasingly competitive business world, there is little room for organisations to be complacent, and adopt a '*business as usual*' approach to strategy. On the contrary, long-term organisational success increasingly rests upon the ability of businesses to routinely innovate, in a timely and effective manner, so that their products, services, business models and processes remain well aligned with ever changing market conditions and expectations [Peppard *et al*, 2015]. In the current, highly dynamic and challenging market environment, it has been regularly argued, in the academic literature, that information technologies are one of the most powerful and effective tools through which businesses can facilitate innovation [Ashurst *et al*, 2012; Joshi *et al* 2010; Kuruzovich 2009].

According to a recent IBM White Paper [IBM, 2015], *'innovation is strongly correlated with value creation and is a key factor in financial outperformance'*, and value creation remains another very important theme within the information systems literature. This is an important finding, particularly in a business context in which there is still a great deal of cynicism about the value of IT: For example, a recent survey of IT executives found that 24% of IT projects were still viewed as outright '*failures*', whilst a further 44% of projects were considered to be '*challenged*', as they were finished late, over budget, or with fewer than the required features and functions [Levinson, 2009]. If IT projects which deliver innovation have the potential to also deliver more real business value, then the role of IT-enabled innovation is certainly a topic that warrants further academic scrutiny.

Against this backdrop, the broad purpose of this paper is to provide fresh insights into the following important research question:

> *How can organisations develop more timely software solutions, which have the potential to facilitate innovation, whilst also delivering value?*

To fulfil this goal, this manuscript reports upon the results of an exploratory study, which monitored the enactment of IBM's *Extreme Blue,* undergraduate internship programme. In short, the *Extreme Blue* programme recruits exceptionally gifted and highly motivated under-graduate students, who have just completed their second year

of university study, and forms them into project teams. Each project team is then tasked to design and develop a software product for a real client, over an intense twelve week period. Consequently, this research study also gave us the opportunity to reflect upon a subsidiary research question, namely: *how can organisations improve their ability to identify and attract the very best graduate, to be employed in technically-oriented roles?*

To provide a provisional report on the results of our research study, the remainder of this paper is structured as follows. First it will provide a critical review of the literature, particularly with regard to the potential of IT to deliver value-adding and innovative solutions, to real world problems. It will then provide an overview of the research approach adopted on this exploratory study, before summarising the key features of the *Extreme Blue* initiative. The study's provisional findings are then presented, before the conclusions and implications to be drawn from this study, are then discussed in the manuscript's concluding section, along with a research agenda through which we plan to extend and deepen our insights, in the future.

2.0   Literature Review

The purpose of this section is to provide a critical overview of the literatures pertaining to the facilitation of innovation through IT, and the leveraging of value from business software, before highlighting the gaps in these literatures, and then presenting the study's objectives.

2.1 IT-enabled Business Innovation

Innovation has become an increasingly important theme within the academic, management literature, and consequently its study has spawned numerous attempts at a comprehensive and distinctive definition. It has been variously defined as the process that:

- *"transforms ideas into **new/improved** products, service or processes, in order to advance, **compete and differentiate** themselves successfully in their marketplace."* [Baregheh *et al*, 2009, p. 1334]*;*
- *"turns an **idea** into **value** for the customer and results in sustainable profit for the enterprise."* [Carlson & Wilmot, 2006, p. 4]*;*

- *"creates a viable offering that is **new** to a specific context and time, creating user and provider **value**"* [Kumar, 2013, p. 1]*;*
- *"the conversion of a **new** idea into **revenues and profits**."* [Lafley & Charan, 2008, p. 21].

In all definitions, there is a common focus / emphasis on the delivery of **value** through the introduction of an idea or approach that is **new or novel**, which leads some commentators to adopt even simpler definitions, such as: *"innovation = creativity + exploitation"* [O'Sullivan & Dooley, 2009, p. 8].

As noted in this manuscript's introduction, many commentators [Ashurst *et al*, 2012; Joshi *et al*, 2010; Peppard *et al*, 2015] believe that because of its power, flexibility and responsiveness, IT is uniquely well positioned to act as a significant catalyst for, and enabler of, business innovation. Indeed, some researchers believe that information technology can be both a source of innovation and the mechanism through which organisations can improve their competitive positioning. For example, Brynjolfsson [2010] suggests that organisations that can use IT innovatively still have plenty of scope to out-perform their competitors, as expressed in the following quote:

"I really think that the way companies implement business processes, organizational change, and IT-driven innovation is what differentiates the leaders from the laggers. Rather than levelling the playing field, IT is actually leading to greater discrepancies. In most industries the top companies are pulling further away from the companies in the middle and the bottom of the competitive spectrum" [p. 55].

Indeed, Ashurst *et al* [2012], provide many concrete examples, of how business software may be used to facilitate innovation, and in so doing, IT still has the '*potential*' to fundamentally reposition a business strategy. More specifically, well focussed software applications can potentially facilitate business innovation in each of the following four broad areas [Peppard *et al*, 2015]:

- Reshape the business model;
- Reshape the customer experience;

- Enable opportunities for product / service innovation;
- Enable opportunities for radically reengineering business processes and practices.

As discussed, more fully, in the following section, IT-enabled organisational transformations, such as those identified above, may well also be prime contenders for the leveraging of business value.

2.2 IT-leveraged Business Value

Because of the very significant levels of investment that organisations now make in their IT architectures, as well as the critical role of IT in organisational processes, the returns that organisations obtain from their IT investments has become a topic of considerable interest to practitioners and researchers, alike [Chau et al, 2007; Doherty, 2014; Schyren, 2013]. However, objectively measuring and demonstrating the impact of IT utilisation on organisational performance has been challenging, as all too often, the results from studies have been conflicting and inconclusive [Mahmood & Mann, 2000]. Consequently, many organisations have been guilty of using this difficulty as an excuse for not bothering to even attempt to measure, monitor or actively manage the benefits that might result from their IT investments [Ashurst *et al*, 2008].

By contrast, rather than simply ignoring benefits, some organisations are seeking to proactively manage the realisation of benefits, from their IT investments. The key premise, underpinning the proactive benefits realisation approach, which has been clearly articulated by Peppard et al. [2007], is that: '*IT has no inherent value*' and consequently '*benefits arise when IT enables people to do things differently*'. This viewpoint is consistent with Markus' [2004] notion of '*techno-change*', which posits that value is typically realised from investments in IT when the investment is managed as part of a project or programme of organisational change. Consequently, it has been persuasively argued that business value is typically realised from the organisational change that accompanies the implementation of technology, rather than directly from the technology's functionality. Against this backdrop, the previously identified transformational areas in which IT can facilitate innovation – reshaping business models, reengineering business processes etc. – might well also provide fertile ground for the realisation of significant business value.

2.3 Literature Critique and Research Questions

The demand for packaged business software has risen greatly, as it becomes an ever more accessible, affordable, homogenous and ubiquitous product [Jadhav & Sonar, 2009], which can be sourced relatively cheaply and swiftly in the form of either 'on-premise' or cloud-based solutions [Bibi et al, 2012]. Consequently, a large proportion of organisations are now attempting to minimise their costs and risks by investing in the same tried and tested software solutions, as their competitors [Gilbert et al, 2012], even if this strategy may limit opportunities for differentiation, innovation, and the delivery of real business value.

In such an environment, organisations may welcome insights into how they might move away from a package-based IT architecture, which probably resembles that of their competitors, to one which facilitates business innovation, and in so doing, will have far greater potential to deliver real value. Unfortunately, to date, there has been very little academic scrutiny directed explicitly to exploring software development approaches that have the potential to deliver innovative and value-adding applications, and consequently, this particular study has been explicitly designed to help fill this gap in the literature.

3.0 The *Extreme Blue*® Programme

IBM's *Extreme Blue* programme is a well-established initiative in which groups of carefully selected undergraduate students are invited to participate in a twelve week internship, running throughout the summer vacation. From IBM's perspective, the initiative provides both an opportunity for identifying high calibre future employees, as well as the opportunity to deliver innovative, value adding software solutions, to some of its key customers.

The key features of the initiative are as follows:
- Four project teams, each comprising four under-graduate internees;
- Each team comprises three technical and one business specialist;
- Each team is given a brief to develop a prototype software solution and a detailed business case, for a real business client;
- Each team is supported by IBM mentors and a suite of design and software tools;

- Each team has just twelve weeks to develop and then demonstrate their application

It is interesting to note that whilst two of the four software projects were being developed on behalf of private sector clients, the other two were being developed to support the operations of public sector organisations. It is not therefore greatly surprising that the specified scope and stated objectives of each piece of software varied greatly. That having been said, there were still some area of commonality, within that all of the four softwares that were ultimately developed. More specifically, each software was: designed to operate, at least in part, via a phone-based application; designed to encourage the user [whether a client or member of staff], to use the application on a regular basis; and each was designed to routinely capture data, so that insights about process performance and user behaviours could ultimately be derived using analytics tools.

The following section outlines the research approach that was adopted to undertake an in-depth study of the *Extreme Blue* programme.

4.0   Research Approach

The foundations of this study can be broadly categorised as interpretative and participative. This research approach is well aligned with the overall goal of the research which was to produce research results which were both: "*relevant and timely*" [Davenport and Markus 1999: p. 20]; and which would deliver "*knowledge about how to intervene in the world and change it in order to satisfy real-world needs*" [Lee, 1999: p. 29]. The case for a "*participatory paradigm*", particularly when conducting IS research, can be justified on the basis that it allows researchers to conduct an "*inquiry from the inside*" [Breu and Peppard, 2003], by working closely with their research subjects. In this particular study, it is difficult to make a clear distinction as to who were the researchers and who were the research subjects as it could be argued that some individuals were both researchers and research subjects, as two members of the research team were also IBM employees, who acted as *Extreme Blue* mentors. However, the presence of three independent academics helped ensure that the research study retained its objectivity, as they were able to examine and critique the project from an external and completely neutral perspective.

As an interesting postscript to this study, the academic researchers were particularly interested to learn that rather than finding their weekly meetings with the academics to be a disruptive, the internee teams reported that they found that these interactions to generally be a positive and rewarding experience. More specifically, the team member reported that it provided them with a great opportunity to step-back from their intensive systems development activities, and critically reflect on their approaches and intentions. Consequently, the issue of enforcing or encouraging periods of critical reflection in agile systems development projects is an issue that we are keen to study further, in due course.

In terms of data collection, the two members of the research team, who were also IBM mentors, were in contact with their Extreme Blue project teams on a fairly regular basis, and could therefore record their thoughts and observations as and when necessary. By contrast, the three academics only met with the project team members at the weekly '*show and tell*' events, during which each project team presented an update on their progress, and had their work critiqued by an audience of IBM researchers and technical specialists. Following the presentational sessions, the academics also had the opportunity to meet up with members of the project teams, to both observe them interacting with their mentors and to interview them about their activities and experiences. Throughout the presentations, observations and interviews, the research team members made detailed notes, which were then analysed, to provide the insights necessary for the production of this manuscript.

5.0   Key Findings

The key findings of this research study, with regard to our primary research question, have been summarised, in Figure 1. In short, it has been possible to identify six distinct factors, each of which, we will argue play a significant role in facilitating IT-enabled innovation, which in turn have the potential to deliver real business value, from the resultant software. Each of the themes, represented in figure 1, will be considered in more detail, in the remainder of this section.
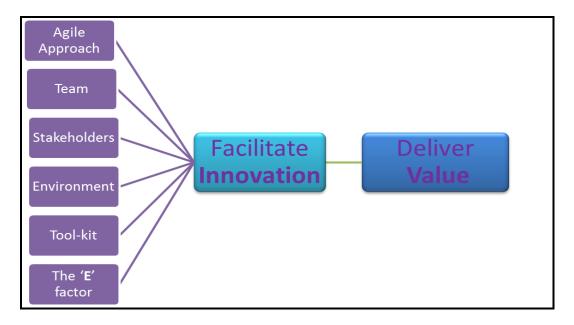
Figure 1.   **Innovation in Practice: Some key findings.**

5.1 The Adoption of Agile Methods

As can be seen from the overview presented in figure 2, the underlying software development method adopted for each of the four projects was a fairly standard, iterative, *Agile* approach [Dingsøyr *et al*, 2012]. Agile methods have been at the heart of the *Extreme Blue* initiative for many years, as they are both appropriate for delivering results in a tight time-frame, and they are a very effective mechanism for promoting the development of innovative software products, as highlighted in the following quote:

> **'***Agile development combines creative teamwork with an intense focus on effectiveness and manoeuvrability.'* [Highsmith, & Cockburn, 2001, p. 120].

One of the real problems that became apparent with the adoption of an agile approach by a group of inexperienced software developers was the difficulty of staying focussed on the absolute need to deliver a completed piece of software, within the twelve week project duration. Inevitably, when a group of very bright and creative individuals is working intensively on a project, they generate significant numbers of pertinent ideas and opportunities, and the dangers of scope creep become very apparent. Consequently, one of the key roles of the business sponsors was to help the team's understand situations in which they were in danger of going off-piste, as opposed to situations in which an idea might be worth pursuing.
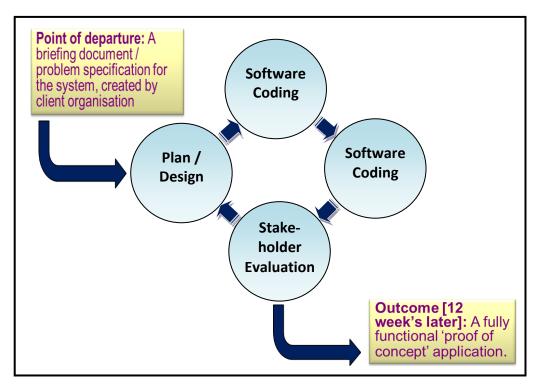
Figure 2: The Role of the Agile Software Development Approach

It is important to note, that whilst each of the four project teams applied their agile methods to good effect, and were ultimately able to develop effective demonstrator applications, it was recognised that inevitably, these softwares suffered from many significant weaknesses. In particular, it was recognised that there were many important privacy, confidentiality, security and efficiency challenges that would need to be resolved if the applications were to successfully make the transition from demonstrator system, to fully operational, organisational software.

5.2 The Team-based Approach

The four person project team is perhaps the critical ingredient in the *Extreme Blue* approach, as all activities, both formal and informal, tended to revolve around the team. The team members worked closely together, not only through the scheduled working day, but they also frequently worked together in the evenings, and at weekends. Moreover, the project team also became the focal point for many social activities, because as well as working closely, the team members also lived and ate together, in the same residence. Having studied the project tams closely, over the twelve week duration of the *Extreme Blue* initiative, it became clear to us that an effective team-based approach was an absolute prerequisite of project success. In

particular, the following two factors were felt to have been important in helping to meld the project teams into effective work groups:

- **Team Trust:** The high levels of trust invested by team members, in each other, was absolutely critical to the team's success. Evidence collected through our encounters with the teams, suggested that initially, the team trust was primarily based upon positive perceptions of team-mates' expertise, whilst later, it was primarily based upon the strength of the relationships that had developed between team members.

- **Team Dynamic:** Both within the teams, and between the teams, there was a productive tension between competition and collaboration, which helped to drive the projects forward, in a positive manner.

5.3 The Participation of Stakeholders

A wide range of stakeholders actively participated in each of the Extreme Blue projects, right from their launch through to the delivery of the functional software and accompanying business case. Key stakeholders included: representatives of the client organisations; the IBM mentors; other IBM researchers and members of other *Extreme Blue* project teams. The desire to actively involve stakeholders was facilitated by the adoption of the *Agile* approach. As Dingsøyr *et al* [2012, p. 1213] note, *Agile* approaches are ideal for facilitating stakeholder involvement:

> '*Customers/stakeholders were no longer just at the fringes of software development, but actively shaped and guided the evolution of the end software product or service.*'

The client sponsors played a particularly important role, as they were able to clarify issues not just with regard to the scope and requirements of the specified application, but also the organisational context within which it was designed to operate. By contrast the IBM mentors provided wider advice about the functionality and operation of different software tools, the application of a wide range of design tools and the development of an effective business case. In terms of the team member's interactions with their mentors, our evidence suggests that the level of dependency was reducing with time; whilst initially the teams were asking for general guidance, as the projects unfolded, the internees needed support less frequently, and tended to ask for very focussed help, typically with regard to technical issues.

5.4 Environmental Factors

The unusual and almost unique environments in which the projects unfolded also had an impact on the success of the initiative. The hot-house environment in which team members worked and lived together, for an extremely intense twelve week period certainly affected the team dynamic, as well as their activities and ultimately their performance. It was apparent that although the teams were co-located and the team members worked very closely together, each team member was allocated a distinct role and individual responsibilities, so that they could retain a degree of autonomy over their own deliverables. For example, one team had split their software development activities, with individual team members responsible for the following three distinct areas: graphical user interface [GUI] development; applications programming interface [API] coding; and database design. It was then interesting to note that these three individuals had even organised their desks, to reflect the natural interfaces between these three software modules, with the API coder located between his two partners.

5.5 Developing an Appropriate Tool-kit

The work of the project teams was greatly enhanced by the availability of a wide variety of tools and techniques to help facilitate the development of the required software applications, which can be broadly categorised as either software tools or design thinking tools, as described below:

- **Software Tools / Platforms:** Each project team was provided with access to a wide variety of proprietary IBM software tools and platforms, such as the *Bluemix* Cloud and the IBM Watson question answering[2] platform, as well as more generalist tools, such as Linux[®3]

- **Design Thinking Tools:** The project teams also had access to IBM's *Tools for Design Thinking*, which included techniques such as *Empathy Maps* and *User Journeys*. For example one, project team used empathy maps to help them understand the needs of three key user groups [the *technophobe* customer; the *tech savvy* customer; and the *call centre agent*]. These maps were then specifically used

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[2] *The Watson platform combines natural language processing, information retrieval, knowledge representation, automated reasoning, and machine learning technologies, so that it can answer potentially complex questions.*

[3] *Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.*

to help the design team map out appropriate user journeys, and then design appropriate user interface. Overall, the design thinking tools were helpful in generating very significant numbers of ideas and possibilities. To help interpret and prioritise these possibilities, the project teams used simple rating classifications, such as *must, would, could* and *should*, or *relevant*, *achievable*, *within scope*.

5.6 The Critical Human Component

In addition to the rather more tangible factors that contributed to the success of the *Extreme Blue* initiative, and supported the delivery of the resultant software application, there was another less tangible, but equally important element, namely the high quality of the individual participants. Each of the project team members was a highly talented individual in his/her own right, but whose performance appeared to be enhanced through working not only within their close-knit teams, but also within the wider context of the *Extreme Blue* initiative. It is difficult to pin down exactly why these individuals made such good project participants. However, having worked with them closely for twelve weeks, members of the research team highlighted the following characteristics, which appeared to be common to all participants:

- **Energetic:** Perhaps it was because of their relative youth, but all the participants all appeared to exhibit almost boundless energy. Having put in a standard working day, they would all be prepared to work through the evenings, and sometimes into the night, particularly if there was a difficult technical or design problem, which they were attempting to resolve.

- **Exceptional:** Each of the participants was chosen because they were exceptional, either in terms of their: academic performance; personal qualities; technical capabilities and skills; and / or their prior activities and experiences.

- **Enthusiastic:** In many ways, the energy and exceptional qualities of the team members were liberated by the very high levels of enthusiasm exhibited by all team members. As well as being highly motivated to succeed, they all appeared to be genuinely interested in the challenges and opportunities with which they had been faced, and this generated very high levels of enthusiasm.

- **Empowered:** The behaviour of the team members also indicated that they all felt highly empowered by the context, in which they found themselves.

Although each of the characteristics, identified above, was clearly an inherent part of each of the individuals, much credit for liberating these capabilities should also go to the IBM professionals who managed the *Extreme Blue* Initiative. Clearly the participant selection processes had a significant role to play in ensuring that appropriate individuals were chosen, and the on-going mentoring process ensured that these characteristics were nurtured over the course of the initiative. Moreover, as all participants were very conscious of the fact that they were being assessed for future employment, with IBM, this helped to maintain their focus and motivation, throughout the project.

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5.7 IT-enabled Business Innovation

Probably the greatest accomplishment of the Extreme Blue project was that it managed to meld sixteen fairly disparate undergraduate internees into four highly productive teams, in a very short period of time. Each of the four teams was able to deliver and demonstrate their functional business applications, within the allotted time-frame, and each of the host, customer organisations were greatly impressed by the teams' efforts. Indeed, each was judged to have not only met, but also surpassed, the client's expectations, as expressed in their original briefing documents.

Although all four of the mini software development projects were judged to have been successful, by the key stakeholders, the question of whether they ultimately delivered innovative solutions also needs to be addressed. While it could not be argued that any of the four resultant software applications used information technology in a radically innovative way, each did combine a wide variety of existing ideas / technologies / functionalities, in a way that had the potential to enable business innovation. As can be seen in the highly summarised results, presented in Table 1, each of the four pieces of software was judged to have had the potential to support innovation, according to a number of the dimensions, as defined by Peppard *et al* [2015]:

	Project 1	Project 2	Project 3	Project 4
Business Model				
Customer Experience	✔	✔	✔	
Product / Service		✔		
Business Process	✔		✔	✔

Table 1. The summarised study results, relating to the facilitation of Innovation through *Extreme Blue®*

5.8 The Delivery of Business Value

At the time of writing this manuscript, it is not possible to make any definitive assessments of the value realized through the four resultant pieces of software, as each was only a prototype solution, so none had been fully implemented. However, the feedback from the client organisations, as well as the IBM mentors, suggests that each has significant value-adding potential. Moreover the two pieces of software designed for use by public sector clients were both felt to deliver real knowledge sharing and communication enhancing possibilities, whilst the two software applications designed for use in the private sector were perceived to offer an even wider variety of benefits, in areas such as:

- Enhanced knowledge of customers behaviours and product usage;
- Sticky applications to deliver a richer relationship with the customers, through regular interactions;
- Ample opportunities to monetise customer interactions;
- The provision of support to staff, so that they could deliver more tailored help to customers

6.0   Concluding Remarks and Research Agenda

In this exploratory piece of work we have sought to demonstrate how an intensive and team-based approach can be used to develop innovative and potentially value-adding business software. In so doing, we have also provided provisional insights into the value of using an intensive and well-focussed project, as an effective vehicle for identifying and evaluating potential graduate recruits. In terms of a provisional research agenda for building upon and extending our exploratory study, the following are all areas and questions that we are actively planning to explore:

1. Can the strategies and approaches explored in this study, be scaled-up so that they can be effectively utilised in more substantive software development contexts;

2. Could the strategies and approaches explored in this study, be as readily used, to good effect, by seasoned IT professionals as they were by undergraduate internees;

3. Building upon point 2, above, we are particularly interested in exploring whether the extremely intensive and tight knit team-based approach can be applied in other systems development contexts.

4. How well do the graduate recruitment processes, examined in this study, compare with more traditional ways of attracting and assessing graduate recruits;

Whilst this is clearly not a definitive agenda for studies in this increasingly important and challenging research domain, these are all areas in which we feel that there are very significant theoretical and practical contributions to be delivered.

References

Ashurst, C., Doherty, N.F. and Peppard, J.,(2008) "Improving the Impact of IT Development Projects: The Benefits Realization Capability Model", *European Journal of Information Systems*, 17, 352-370.

Ashurst, C., Freer, A., Ekdahl, J. & Gibbons, C. (2012) "Exploring IT-enabled innovation: A new paradigm?", *International Journal of Information Management*, **32** (4), pp. 326-336

Baregheh, A., Rowley, J., & Sambrook, S. (2009). "Towards a multidisciplinary definition of innovation". *Management Decision, 47,* 1323-1339.

Bibi, S., Katsaros, D., & Bozanis, P. (2012). Business application acquisition: on-premise or SaaS-based solutions?. *Software, IEEE*, *29*(3), 86-93.

Breu, K. and Peppard, J. 2003. "Useful knowledge for information systems practice: the contribution of the participatory paradigm", *Journal of Information Technology*, Vol 18 (3) p.177-193.

Brynjolfsson, E. (2010). "The four ways IT is revolutionizing innovation: An interview with Erik Brynjolfsson", by M.S. Hopkins. *MIT Sloan Management Review*, 51(3), 51–56.

Carlson C.C., & Wilmot, W.W. (2006). *Innovation: The five disciplines for creating what customers want.* New York: Crown Business.

Chau, P. Y., Kuan, K. K., & Liang, T. (2007). Research on IT value: what we have done in Asia and Europe. *European Journal of Information Systems*, *16*(3), 196.

Davenport, T.H. and Markus, M.L. 1999. "Rigor v Relevance Revisited; Response to Benbaset and Zmud". *MIS Quarterly*. Vol 23 (1) p.19-23.

Dingsøyr, T., Nerur, S., Balijepally, V., & Moe, N. B., (2012) "A decade of agile methodologies: Towards explaining agile software development", *Journal of Systems and Software*, 85(6), 1213-1221.

Doherty, N. F. (2014). "The role of socio-technical principles in leveraging meaningful benefits from IT investments". *Applied ergonomics*, *45*(2), 181-187.

Gilbert, A.H., Pick, R.A. & Ward, S. G. "Does 'IT Doesn't Matter' Matter?: A Study Of Innovation And Information Systems Issues", *Review of Business Information Systems, 16 (4), pp 177-186.*

Highsmith, J., & Cockburn, A. (2001). "Agile software development: The business of innovation". *Computer*, *34*(9), 120-127.

IBM (2015) "Patterns for the Social and Digital Enterprise: the repeatable patterns that improve business processes and provide return", *IBM Executive White Paper.*

Jadhav, A. S., & Sonar, R. M. (2009). "Evaluating and selecting software packages: A review". *Information and software technology*, *51*(3), 555-563.

Joshi, K., L. Chi, A. Datta, and S. Han. "Changing the Competitive Landscape: Continuous Innovation through IT-Enabled Knowledge Capabilities," *Information Systems Research* (21:3), 2010, pp. 472.

Kumar, V (2013). *101 design methods: A structured approach for driving innovation in your organization*. Hoboken, NJ: John Wiley & Sons, Inc.

Kuruzovich, J. "Responding to Technology-Enabled Organizational Transformation,"*Proceedings of the Americas Conference on Information Systems,* 2009, pp. 1-15.

Lafley, A.G., & Charan, R. (2008). *The game-changer: How you can drive revenue and profit growth with innovation.* New York: Crown Business.

Lee, A.S. (1999). "Rigor and relevance in MIS research: beyond the approach of positivism alone". *MIS Quarterly*, 23(1), 29-33.

Levinson, M. (2009) "Recession Causes Rising IT Project Failure Rates", *CIO Magazine*, **18**, June.

Mahmood, M. A. & Mann, G. J. (2005) "Information Technology Investments and Organizational Productivity and Performance: An Empirical Investigation". *Journal of Organizational Computing & Electronic Commerce,* 15**,** 185-202.

Markus, M.L. (2004) "Technochange management: using IT to drive organizational change", *Journal of Information Technology*, **19**(1), 4-20.

O'Sullivan, D., & Dooley, L. (2009). *Applying innovation.* Thousand Oakes, CA: SAGE Publications.

Peppard, J., Ward, J. & Daniel, E. (2007) "Managing the realization of business benefits from IT investments", *MIS Quarterly Executive*, **6**(1), 1-11.

Peppard, J., Robinson, S. & Hüsing, T. (2015) "Improving digital innovation in large enterprises: Strengthening e-leadership at C-level", *The European Business Review* January/February, pp. 15–19.

Schryen, G. (2013). Revisiting IS business value research: what we already know, what we still need to know, and how we can get there. *European Journal of Information Systems*, *22*(2), 139-169.