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SHIFTING TO INTEGRATED SOLUTIONS: RECONCILING INNOVATION AND PROJECT MANAGEMENT

✉ **Dr. Carlos E. Yamasaki Sato**

University of Sussex – UK
Science Policy Research Unit - Lecturer in Management
C.E.Y.Sato@sussex.ac.uk

ABSTRACT

This paper investigates the shift to integrated solutions of incumbent telecommunications operators as part of their business transformation to survive the competitive market. It shows how innovation management and project management can reinforce the various practices at the firm level in order to foster growth and improve performance. Innovation management and project management have different roots and initial drives, but in the last years increasing research has been undertaken in order to point out the interconnectedness of both approaches. However, only few researches have demonstrated how innovation and projects interact and are implemented in practice. Integrated solutions offer such an arena for interaction, and a case study of BT Global Services (BTGS) is used in order to show the interdependencies of innovation and projects. Incumbent telecommunications operators such as BT in the UK need to innovate in order to cope with ever increasing competition in the ICT sector. Driven by a strategy of innovation, BT set up BTGS to deliver integrated solutions projects to large firms. These projects offer in turn a unique position for BT to profit from tacit knowledge about customer needs and wants, innovating for the customers and feedback to BT's innovation strategy. This facilitates BT's long-term strategy in a very competitive and turbulent environment. A theoretical framework, based on a combination of innovation and project management processes, is used to approach the case study of BTGS, and an empirical more realistic and accurate framework is offered in order to better inform managerial practice.

INTRODUCTION

Innovation management and project management come from different roots, and have been mostly treated separately in the literature. However they share the common reality of firms in pursuit of survival and growth. Firms deliver projects constrained by time, cost and quality. However, as projects have aspects of uniqueness, firms are required to innovate while delivering projects. This paper addresses the shift to integrated solutions of incumbent telecommunications operators as a significant step for their business transformation, and to illustrate the relationship between innovation and projects, arguing that this relationship has been strengthening as projects and project capabilities are seen as drivers for firms' survival and growth through their innovation processes.

On the one hand innovation seems to be a broader concept including the invention and commercialization of ideas (Freeman & Soete, 1997). On the other hand projects are a disciplined and systematic way of turning invention into successful commercial products and services. This in turn leads to projects driving innovation (Davies & Hobday, 2005), hopefully creating a positive feedback loop which will contribute to the long term survivability and growth of firms.

The starting point of this paper is to take the process view of both innovation and projects. The innovation strategy of any firm can be seen as having the following phases: (i) searching for innovation opportunities, (ii) selecting the best ones to implement, (iii) implementing them, and (iv) capturing value and benefits from and with them (Tidd & Bessant, 2009). On the other hand, the project portfolio life span can be seen as having the following phases: (i) identifying needs and opportunities, (ii) selecting the best combination of projects (*the portfolios*), (iii) planning and executing projects (*project management*), (iv) launching products, and (v) realising benefits (Wideman, 2004, p. 181). The overlaps are evident when comparing innovation process and project portfolio process.

This paper aims to present integrated solutions as an integrative view of innovation and projects, highlighting that they reinforce each other as the firm strives for survival and growth. The research questions that guide this paper are: how

have integrated solutions emerged as a significant business model for the business transformation of incumbent telecommunications operators? How do integrated solutions reconcile project management (*with its constraints*) and innovation management (*with its openness*)? Are integrated solutions a feasible business model for incumbent telecommunications operators? A case study of BT Global Services (BTGS) in the UK is used to illustrate this integrative approach. This case refers to the organisation of one part of BT's business: the delivery of 'integrated solutions as projects employing ICT-based services. 'Integrated solutions' is a business model delivered by projects where the supplier is engaged in providing a range of products and services (*theirs and/or from third party firms*) to meet a more comprehensive customer's business and operational needs (Davies, 2003a; Davies, 2003b; Davies, 2004; Davies & Hobday, 2005). An initial theoretical framework, derived from the literature review, is used to approach the BTGS case study. As a result a more realistic and evolutionary framework is proposed with the aim of better informing managerial practice.

Research Methodology

This paper is part of a broader research that investigated the strategies for business renewal of incumbent telecommunications operators. The research was based on a case study method and was done in three stages. The evidence was obtained through documentary analysis and a large number of interviews. Stage 1 was the exploration phase where the context of the research problem and incumbent operators were investigated. One of the outcomes of this phase was to narrow the options down to BT as the main case study to be developed. Stage 2 was the phase of exploitation where more information about BT and the industry was gathered addressing the research questions on the three logics of technology, organisation and customer. Stage 3 served to further exploit the insights and propositions reached in phase 2 and attempted to confirm (*or not*) those propositions. The research methodology is fully described in Sato (2014) and it is not included in this paper.

BT was chosen because of its urgent need of renewal and transformation in the 2000s due to competitive threats and unfavourable financial position of the incumbent telecommunications operators in some of the developed European countries.

Structure of the Paper

This paper is structured as follows: Section 1 makes a brief literature review highlighting the different roots of innovation and project management, and its convergence when innovation and projects/portfolio are approached at the firm level to deal with issues of survival and growth. It also highlights the similarities of the innovation management and project portfolio processes, proposing a theoretical framework (Figure 1) which combines both perspectives. The theoretical framework is used to structure the following empirical sections. Section 2 deals with the drivers of integrated solutions at BT, showing the search for opportunities and identification of needs through ‘niche’/initial projects at departmental level. Section 3 discusses the rise of integrated solutions projects at BT culminating to a vanguard project (Unilever) which set the ground for the establishment of BT Global Services in 2004. This section looks into the project selection process and highlights the importance of the vanguard project, which is commonly overlooked by the theoretical frameworks. Section 4 elaborates on how BTGS built the business of integrated solutions, including the various challenges and drawbacks that this kind of business can face until it is profitable. This section draws mostly on the planning and execution of projects, according to the theoretical framework. Section 5 draws a discussion about the process of building the business of ‘integrated solutions as projects’ of BTGS, highlighting the innovative aspects that they bring, feeding back into the innovation process of the whole organisation. This section shows various processes, tools and techniques that were used by BTGS in order to capture value and eventually turn the whole BTGS into a profitable business. Section 6 compares the theoretical framework with the empirical framework obtained from the case study, drawing managerial implications and providing an empirical view of how projects and innovation evolve towards and within a project-based organisation. This contributes to a positive feedback loop between innovation and projects to facilitate BT’s long range planning for innovation and growth. Finally, Section 7 draws the main conclusions of this paper. It highlights the combinative

strengths of innovation and the management of business projects, evidencing the differences between the theoretical and empirical frameworks and their implications on management practice.

1. The Business of Integrated Solutions: Reconciling Project and Innovation Management

Innovation management and project management have different roots with different initial emphasis, but it is interesting to note that over time these two disciplines came to overlap in order to address firm’s survival and growth. Innovation management literature may be more developed and extensive than project management literature (Shenhar & Dvir, 2007), but there is an increasing number of books and papers that attempt to relate both (e.g. Leal-Rodriguez, Roldan, Ariza-Montes, & Leal-Millan (2014), Akbar, & Mandurah (2014), Chandrasekaran, Linderman, & Schroeder (2014), Kapsali (2011), K. Artto, Kulvik, Poskela and Turkulainen (2011) and Bygstad and Lanestedt (2009)). Project management, once dominated by practitioners and consultants, has recently been gaining more attention by the academic community (Soderlund, 2008). Project management tends to be seen as the discipline mostly concerned with ‘getting the job done’, and therefore may stifle innovation (Keegan & Turner, 2002). On the other hand, the need for growth and innovation may lead firms to organise themselves by projects or to create business units (parts of their organisation) managed by projects (i.e. creating project-based firms as part of the whole organisation) (K. A. Artto & Wikstrom, 2005; Davies & Hobday, 2005; Shenhar & Dvir, 2007).

Innovation driving Projects

Innovation management presents a rich literature and, in particular, Shenhar and Dvir (2007) present the idea of mapping different types of innovation, such as incremental and radical innovation (Burns & Stalker, 1961; Freeman & Soete, 1997), to different types of projects. Different types of projects entail different styles of management (Shenhar & Dvir, 2007).

The congruence between innovation and projects becomes more evident when the phases used for representing the innovation process within a

firm are confronted with the phases of a firm’s project portfolio management. For example, Tidd and Bessant (2009) use the following phases to characterise an innovation process: (i) searching for opportunities for innovation, (ii) selecting the best ones to pursue, (iii) implementing them, and (iv) capturing value and benefits from them. On the other hand, Wideman (2004) proposes the following phases to characterise the management of a firm’s project portfolio: (i) identifying needs and opportunities, (ii) selecting the best combination of projects (portfolios), (iii) planning and executing projects (project management), (iv) launching product (i.e. delivering outcomes), and (v) realising benefits. It is clear that these frameworks overlap, and although the initial emphasis of innovation and projects seems to be different, they start to converge when the unit of analysis is the firm, relating to its strategic level.

Innovation management literature has been mainly concerned with the nature of the contents of innovation, such as radical and incremental innovation (Burns & Stalker, 1961; Freeman & Soete, 1997), architectural and modular innovation (Henderson & Clark, 1990; Tushman & Anderson, 1986), disruptive and sustaining innovation (Christensen, 1997), and open innovation (Chesbrough, 2003). On the other hand, project management has been chiefly concerned with the work to be done in order to achieve specific aims as it is the approach found in Kerzner (2006), Maylor (2010), and Meredith and Mantel (2006).

Those from innovation background claim that businesses can use projects to drive business strategy and innovation (Davies & Hobday, 2005). Others claim that execution is ‘the other side of innovation’ (Govindarajan & Trimble, 2010). This is not surprising if it is considered that, within the innovation process, implementation/execution is one of its phases as proposed by Tidd and Bessant (2009).

Projects driving Innovation

With the diffusion of project management to firms in the civil sector, and the increasing concern with the portfolio of projects (not only with the management of single projects), project management started to be catapulted to the strategic level and to be related to innovation and growth of firms. For example, Cassiman, Di Guardo, and Valentini (2009) illustrate how R&D projects can be organised in order to profit from innovation. The focus becomes the portfolio of projects (not a single project) and how to best organise them in order to increase the performance of the firm. The challenge is

the management of projects in an environment that strives for innovation (see, for example, Calamel, Defelix, Picq, & Retour (2012), Bygstad, & Lanestedt (2009), Parast (2011), and Kapsali (2011)).

Project business (K. A. Artto & Wikstrom, 2005) or the business of projects (Davies & Hobday, 2005) recognises that parts of the business (or the whole business) can be run by projects to improve performance of firms as part of their strategy for innovation and growth. And from a base in projects, the aim is to affect innovation and growth (see, for example, Taylor and Raymond (2007)). Some studies focus on R&D projects (e.g. Cassiman et al. (2009) and Biedenbach (2011)), and others focus on business projects aiming to satisfy external customer’s needs and wants (e.g. Davies and Hobday (2005)).

Integrated Solutions: Innovation and Projects in the same stream

The brief literature review above aimed to highlight the convergence of innovation management and project management from the perspective of the strategic level of the firm. Processes involving innovation and project portfolio (i.e. comparing Tidd and Bessant (2009), and Wideman (2004)) indicate that they are part of the same stream that contributes to the survival and growth of firms.

Integrated solutions have been attracting some attention in the last years in the literature due to is power of generating large amounts of revenues (and hopefully profits) for large corporations in the high tech sector (Oliva & Kallenberg, 2003; Wise & Baumgartner, 1999). Examples such as Alstom Transport, Ericsson Mobile Systems, Thales Training and Simulation, WS Atkins and C&W show the deployment of integrated solutions as a business from a manufacturing (the first three firms) and from a services (the last two firms) base (Davies & Hobday, 2005). Wise and Baumgartner (1999) claim that manufacturing firms are moving downstream into services because it is where the money is. And Davies and Hobday (2005) demonstrated that not only manufacturing, but also service firms are moving to integrated solutions. This represents the servitization (cf. Neely, 2007; Vandermerwe & Rada, 1988) not only of manufacturing, but also of service firms, which are increasingly embedding the culture of service-dominant logic (cf. Vargo & Lusch, 2004).

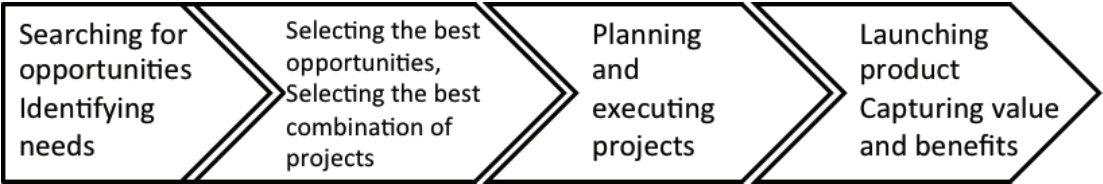


FIGURE 1. Merging the frameworks for innovation and project management
Source: Adapted from Tidd and Bessant (2009) and Wideman (2004)

Section of the Paper	Title of the Section	Correspondence to Theoretical Framework
3	The Drivers of Integrated Solutions at BT	Searching for opportunities Identifying needs
4	The Rise of Networked IT Services as Integrated Solutions Projects at BT	Selecting the best opportunities Selecting the best combination of projects
5	Building and Managing the Business of Integrated Solutions Projects at BT Global Services	Planning and executing projects
6	Capturing value and benefits: delivering integrated solutions projects for innovation	Launching product Capturing value and benefits

TABLE 1. The correspondence between the sections of the paper and the elements of the theoretical framework

The Theoretical Framework: combining innovation and project portfolio management processes

From the literature review above, the innovation process proposed by Tidd and Bessant (2009) and the process of project portfolio management proposed by Wideman (2004) are very intertwined, and they can indeed be interpreted as having the same rationale as shown in Figure 1.

Based on this ‘rational’ framework, the case study of BT Global Services below used this framework for gathering and analysing data in order to investigate the emergence of integrated solutions as the locus of innovation and projects. Each of the following sections (from Section 2 to Section 5) has a correspondence to the theoretical framework above, as depicted in Table 1.

2. The Drivers of Integrated Solutions at BT

The main trends that are driving the BT’s innovation towards integrated solutions represented by projects delivering networked IT services are the following: (i) the switch to digital, (ii) globalisation, including workforce globalisation, (iii) real-time processing, and (iv) outsourcing (Green, 2006).

The switch to digital means ‘the ability to digitise information and send it reliably and cheaply anywhere it needs to be: into customer’s hands or into supplier’s hands around the world’ (Green, 2006). This means the ability to move information to the right place and at the right time. Right place means anywhere in the world where the large corporation has an office or a plant. And most of the large corporations have operations distributed over several countries. Right time means moving information quickly and reliably. In the most demanding cases, quickly means establishing real time

sessions and real time processes such as those found in the financial services applications.

Globalisation means that firms are locating their facilities in different parts of the world due to lower labour costs or to be closer to customers, and moving information to the right place also means to the right people. And this includes the globalisation of the workforce, where work is off shored to countries like India and China, where the level of education is becoming higher and the long distance (at least between urban centres) is becoming a lower barrier due to the development of information and communication technologies. What is coming is an environment in which the whole organisation is run on a global basis, in real time and therefore this organisation’s concerns about reliability, quality and resilience are growing exponentially (Green, 2006). This is the environment where BT’s capabilities have been developing in terms of reliability, quality and resilience of services for large businesses.

Another driver and tendency identified is outsourcing. Firms are more prone to focus on its core business. And for them, establishing, maintaining and upgrading their IT networks are not within their core competence. Historically, some incumbent telcos have been managing different parts of the IT networks of their customers, and at a certain point it makes sense for the customer to outsource the IT network (BT Senior Manager, March 2006). In other cases, the customer’s IT network grows in size and complexity in such a way that it does make sense to outsource to another firm that manages IT networks as its core business. Thus, increasingly, enterprise customers are opting for managed services, out-tasking and outsourcing (Green, 2006).

The ‘golden opportunity’, as BT calls it, lies in the intersection of three domains (network, IT and services), as depicted in Figure 1. This figure represents much of the nature of integrated solutions within BT and other telecom operators. Network products are at the traditional core competence of BT and other incumbent telecom operators.

IT products are mostly accessed through partners, and professional services are a major capability that BT needs to develop in order to support the other two domains. Professional services, within the context of this research, can be defined as a knowledge-intensive type of service delivered by highly qualified professionals and which requires a high degree of customisation and intense face-to-face interaction with customers (Lowendahl, 2005; Maister, 1993). Professional services include consulting capabilities, systems integration and outsourcing. These capabilities change the relationship nature with customers from a predominantly transaction-based to a predominantly long-term relationship focusing on the customer’s evolving needs, wants and frustrations.

Another interesting point of Figure 2 is the fact that services (and in particular professional services) can be viewed as integrating the other two domains (network and IT products). This reflects the idea that BT Global Services is ‘a services business with a network inside, not a network that does some services’ (Craig, 2006).

Building a business like BTGS was not done overnight. As one BT Executive said:

[...] I have been in the company for 16 years and the evolution to create Global Services has been at least 12 or 14 years to get to where we are. We started with a business that we used to call MNS – Managed Network Services – to ask how you can add value onto customers’ solutions. To build this company is not something that you can decide to. We did not wake up last week and think, ‘We think

there is a new opportunity. Perhaps we should be adding more value to networks’. There is an inevitability in the market. When all you are selling is capacity and bandwidth and that is your value, then it is not a great economic model. That was foreseen a very long time ago and that is why of 27,000 people, 11,000 are paid by the customer for their knowledge. It takes time (Craig, T., Presentation, 14 September 2006).

Several market forces like globalisation and outsourcing have been playing in the market for a long time, and made many telecom operators (not only BT, but also Deutsche Telekom, France Telecom, C&W and others) to establish their ‘Global Services’ division. Usually these divisions started out as responsible for doing system integration and consulting, in some instances, by the acquisition of other firms, and were gradually consolidated into a wider global services division, with high influence in the incumbent operators’ internationalisation strategy.

This section discussed the main drivers of integrated solutions (i.e. digitalisation, globalisation, real-time processing and outsourcing) which are also in the background of BT’s innovation strategy. These drivers affected not only how BT and other incumbent telecommunication operators make business, but also how other large firms such as the telecommunications equipment suppliers (e.g. Ericsson, Alcatel, etc.) make business. Next, Section 3 analyses the rise of networked IT services as integrated solutions projects at BT Global Services (BTGS). It illustrates the evolutionary construction of BT Global Services having integrated solu-

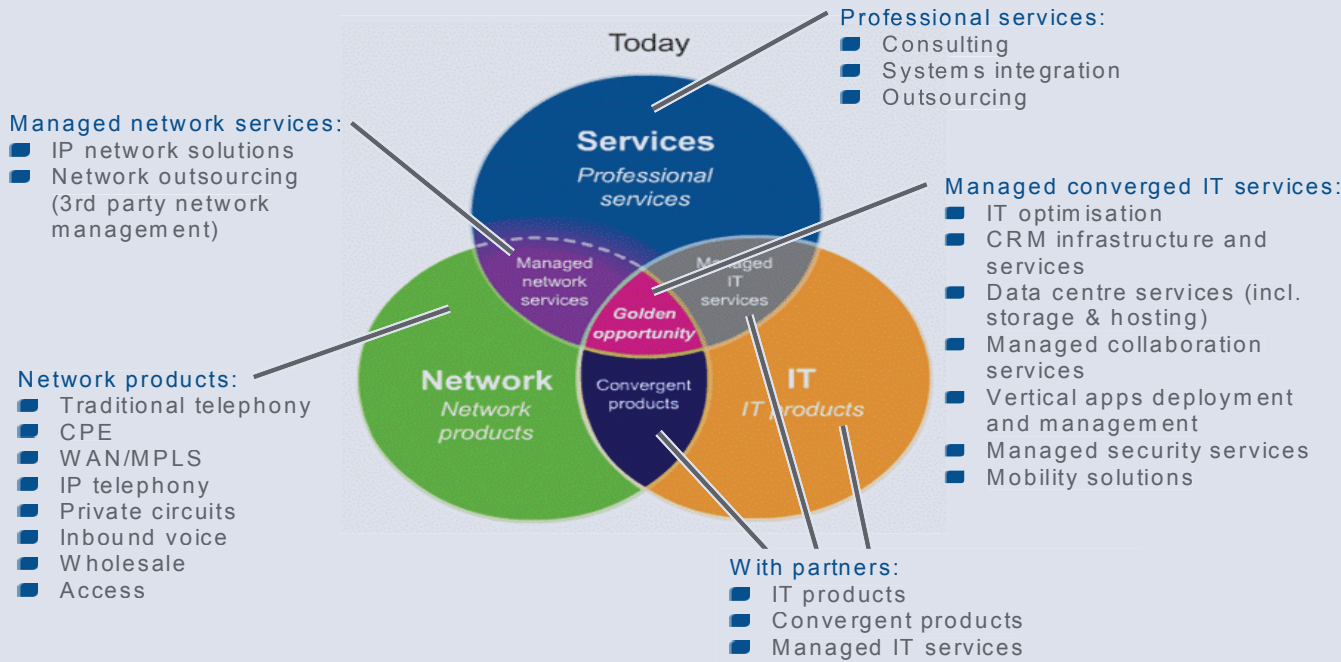


FIGURE 2. BT’s networked IT services portfolio
Source: Presentation by BTGS CEO Andy Green (Green, 2006)

tions projects as their primary activity to address BT's performance gap and to become more competitive.

3. The Rise of Networked IT Services as Integrated Solutions Projects at BT

The selection of the best opportunities in terms of the projects to be executed is illustrated by the vanguard project Unilever, which was deemed as the project which made feasible the establishment of BT Global Services.

The concept of vanguard project is elaborated in Brady and Davies (2004) and Frederiksen and Davies (2008) as the 'landmark' initial project which launches and makes feasible the project-oriented business unit based on integrated solutions projects to large customers. The business of integrated solutions in BT is usually called 'networked IT services'. It represents the convergence of three domains (*network products, IT products and professional services, as shown in Figure 2*), and it is 'adjacent to [BT's] heritage and strength' (Craig, 2006). The latter phrase is an indication of the intention to retain the core competence of BT in building and maintaining a network. The difference is that BT moves from not only building and maintaining its own network, but also from building and maintaining other organisations' networks as an extension of its own.

3.1. Vanguard Project

In order to understand customer needs, and how BT selects its projects (or how BT is selected in a bid process), the analysis starts with one of BT's major customer, Unilever, which was important in setting up the business of integrated solutions and consequently BT Global Services. Unilever has a special meaning to BT as it was the contract that provided a step change in BT Global Services' business (BT Senior Manager, Interview, March 2006).

In this type of business it is usual to have a tender process, and the Unilever contract was no exception. The short list of bidders included AT&T, BT, Deutsche Telekom, France Telecom and Sprint. This contract can be seen as a strategic partnership, as the relationship between BT and Unilever went beyond the functionalities of the solution to the establishment of a shared vision of the future. The specific project was fortuitous as 'BT's ambition to move into a global space matched Unilever's needs' (Cameron, N., Presentation, 14 September 2006). In other words, BT and Unilever shared common goals at the strategic level. International presence is part of BT's overall strategy and one of the main targets to be achieved by the networked IT services through BT Global Services. In the same way, as globalisation is a driving force for large multinational firms, so it is for Unilever (BT, 2006).

Unilever signed a multi-year contract with BT, that was said to be a 'leap of faith' (Cameron, 2006). Unilever had a contract with WorldCom at that time and in the first half of July 2002 WorldCom failed, and the telecom industry as a whole was in bad shape. An account of WorldCom's demise can be found in Jetter (2003). Unilever decided to sign with BT in December 2002. This reveals a major contextual influence on winning a contract: the failure (*bankruptcy*) of the previous provider at the time of negotiating the contract. The 'leap of faith' was due to the fact that this type of multi-year contract has many challenges and it usually does not work as it was supposed to do in the early stages (*usually in the first three years*) (Cameron, 2006). To resolve this problem it is necessary to invest in the relationship and in the values of the provider (BTGS): it is necessary to believe that the firm (BTGS) will be able to execute (Cameron, 2006). Although evidences and prior experience are requested, they do not guarantee success. At the end of the day, it is necessary to believe that BT (*the provider*) will do what they are saying they will do; that is the 'leap of faith'. In other cases, previous suc-

cessful relationships help to lower the barriers for this 'leap of faith'. This case shows that there are many aspects of the relationship that need to be worked out throughout the project. Before going on to these relationship issues, it is important to look at BT's selection as the service provider for Unilever for this specific project.

Next, section (*Section 4*) illustrates how BT built and managed the business of integrated solutions projects after the Unilever vanguard project, and how it contributes to its innovation strategy.

4. Building and Managing the Business of Integrated Solutions Projects of BT Global Services

Building a business based on the integrated solutions projects requires a reorganization of the structure in order to be more customer-centric, a reassessment of the business model, and a preparation of the organization in order to be open to the co-creation of value with customers. This section tackles these issues, recalling that the innovation strategy requires robust business models in order to co-create value with customers in the long-term.

The differentiator of the business of integrated solutions projects is firmly based on the quality of relationship with the evolving needs of customers with the aim of persuading these companies to renew contracts after some years. In fact, much of the value and profits of this type of business are dependent on long-term relationships with the customer. BT's position in the UK and especially in London, where many multinational firms have placed their headquarters, set good conditions for the business of integrated solutions to thrive (BT, 2006). This

may not be the case for other operators in Europe, where the volume of this business is lower. Also, to change the internal culture of the incumbent telecom companies into a more professional services environment may prove too difficult for some operators.

For this type of business to thrive in the long term, it is necessary to gain some efficiency in terms of repeatability and knowledge transfer, where the solution provided for the next customer can be re-used to some or large extent from the solution developed for the previous customer (Craig, 2006). This reinforces the innovation strategy being implemented by BT at the strategic level and instantiated in other parts of the business within BT. The repeatability usually refers to repeatable solutions (Davies & Brady, 2000), and also the importance of acquiring good references in order to market services to new customers. Although projects are supposed to be unique, customers usually ask for other customers where the proposed solution was implemented. This is supposed to reduce the execution risk for the new customers. The requirements of having good financing capabilities and good references in the market may make the business of integrated solutions not accessible for many companies. But it is a major opportunity for large firms which need to grow and grow fast, and cannot rely on breakthroughs only for their growth.

The types of contracts/projects that BTGS started to deal with are of higher values, long term (*for some 3 to 10 years usually*) and one important part for the profitability of this business is the renewal of major contracts. BT claims that around 90% are renewed and, as noted earlier, long-term contract is essential for the profitability of the business model (BT, 2007). Each contract represents a different customer with different needs. In this sense, skills in large scale project management are important. In some instances, the learning in one project can be transferred to another, but the real gain (*and profit*) occurs when the contract is re-signed (BT, 2007). Large business-to-business

contracts where factors like trust, reliability and security are valued.

In the case of BTGS, re-signing is an important feature of this type of integrated solutions projects in order to be profitable in the long term (Green, 2006). Thus the transition from the operational services phase to the strategic management phase is important for the profitability of the business model when a contract is renewed due to the identification of another project or due to the extension of the operational services phase. In this transition, this cycle could take the form of a spiral to emphasize the identification of a new project and the re-sign of contracts. Besides that the strategic engagement seems to be important over all the phases of the life cycle, as BTGS is trying to build trust and long term relationships with their customers. One special measure of success in these integrated solutions projects is when the same customer extends the contract and relationship for additional years. The ultimate aim of BTGS would be to achieve customer 'lock on', i.e. which happens 'when customers want the enterprise as their sole or dominant choice' (Vandermerwe, 2003, p. 56). According to Vandermerwe (2003), customer lock-on differs from customer lock-in and customer loyalty. When customers are locked in, even when they are dissatisfied, they have no choice of changing suppliers as the alternatives do not present a real gain for the customer. And customer loyalty assumes that customers repeat the purchase of the same product or service. Further discussion can be found in Vandermerwe (2001) and Vandermerwe (2003).

The case of Barclays Africa illustrates the long term relationship required for the profitability of the business of integrated solutions. BT and Barclays Africa already had a ten-year relationship when their service contract was coming to an end in March 2004. This was the point of transition from the operational services to the strategic engagement phase, where BT was providing installation and support for Barclays Africa's satellite network to

provide real time services to customers in Africa. And the end of the contract represented an opportunity to 'take a fresh look at Barclay Africa's strategic telecommunications requirements' (BT, 2007a, p. 2). Although other options were considered, BT was selected due to its existing relationship, good service availability in Africa and technological and operational expertise. These factors composed a good value proposition for the integration and building of a broadband infrastructure including satellite-based solution. The project lasted less than 12 months from contract sign off to full implementation. After the project finished, operational services continued with the technical support for the broadband infrastructure in an ongoing basis until a new major customer need is identified.

Another example is VISA CEMEA (*Central and Eastern Europe, the Middle East and Africa*). BT has had a relationship with VISA as a network provider since the early 1990s. In 2002, VISA CEMEA recognised that the legacy networks were no longer adequate to keep pace with business growth and response times required for the card business (BT, 2007d). Besides that, VISA wanted to consolidate its network and reduce the number of supplier contracts. About 250 firms took part in the initial negotiations and eventually BT was selected as the provider of the new network (BT, 2007d). The new network was built and BT continued to be a prime partner of a managed service solution. The result is better availability of the network and an improvement in the response time for card processing. An interesting concept that was used in this project was the 'in-sourcing', i.e. BT people working inside the VISA organisation. This helps to identify and solve problems quickly, and better positions BT for another round of strategic engagement for another integrated solution project.

The year of 2005 was a remarkable year for BT Global Services as it reported operating profit, proving the business of integrated solutions projects. 'The 2005 financial year saw Global Services deliver its first ever

full year operating profit before goodwill amortization and exceptional items, at £7 million' (BT, 2005b, p. 33). However, recent developments in November 2008 indicate major setbacks in BTGS (Barker, 2008), and it is early to assess its long-term effects on the whole business. This resonates with similar financial problems with firms like IBM, WS Atkins and Serco (Davies, 2003) and the significant number of bankruptcy cases of firms in the servitization context (Neely, 2009).

In order to build the business of integrated solutions projects, BTGS needs to be in close contact with their customers in order to create value and profit in the long term. Fundamental to the long term profitability is the re-signing of contracts, which occurs when BTGS identifies a new project within the same customer or when the customer wants to extend the operational services phase due to a satisfactory experience with BTGS. The ultimate aim is to achieve customer lock-on as the relationship was satisfactory and the customer is willing to continue it even with the presence of other potential competitors.

5. Capturing value and benefits: delivering integrated solutions projects for innovation

The business model of integrated solutions projects is demanding because for its profitability it depends on the long-term relationship with the customer and on the ability of the provider to reuse its solutions (BT, 2007). As there are many projects under execution at the same time, an appropriate process of knowledge access and transfer needs to be in place (BT, 2007). Creating this repeatability and reuse has not been easy for BT. It is also influenced by the fact that this depends on the level of maturity or life-cycle of the whole business: BT Global Services was established in 2003, although consulting and systems integration activities had already existed before this for many years (since 1997). The project may be profitable in itself, but on average, it takes between two and three years for a large integrated solution project to contribute to the profitability of BT. It also takes around three to four years for the cumulative cash flow to become positive (Green, 2006). This is a type of business that requires financial strength and consistency of high quality services for an extended period of time dedicated to defined customers. The profitability of the business model depends greatly on renewing the contracts, i.e. extending the contract for a longer period of time which may extend the profitability period, and ultimately enhancing repeatability and replication.

Unilever, for example, signed an initial contract of five years, and 'they re-signed for a further five, which is quite unusual [in the telecom business]' (Barrault, 2006). The

Land Registers of Northern Ireland established a 12-year strategic partnership with BT in an account base marketing programme to modernise the Land Registers' systems (BT, 2007b). The City of Edinburgh entered into a 15-year IT outsourcing partnership with BT with the aim to transform the council's IT system and hence improve council services (BT, 2006). BT engaged in a 12-year public private partnership (PPP) contract with Disclosure Scotland in order to design and manage criminal record check applications (BT, 2007c). Disclosure Scotland is part of the Scottish Criminal Record Office (SCRO). It was established in 2002 and it allows an individual's criminal record to be available not only to select organisations, but also to those which work with children and vulnerable people (BT, 2007c). There are some other examples of long-term contract and re-signing which support BT's business model of integrated solutions. However, many contracts and projects are delivered in the short/medium term (one year or two), and although '[BT's] contracts are moving from one or two years to five, six or seven years' (Barrault, 2006), another dominant player, IBM, stated that there is a trend in their Global Services to 'shift to smaller deals of shorter duration, higher profitability and more industry-specific focus' (IBM, 2006, p.4). Hence, the strategy of BTGS to depend on long term contracts and re-signing for profitability is questionable.

Global Contract Profitability

This integrated solution type of business requires financial strength from the provider. The fact that the aim is to absorb risk for the customer implies that the provider (i.e. BTGS) assumes that risk, who in turn may be able to transfer it to their own suppliers or third party firms (e.g. insurance companies). The business model depends on long-term relationships (five years is supposed to be a good average) and one of the success criteria would be to re-sign the contract if it involves providing continuous services to customers. Considering the whole business of BTGS, projects and contracts are likely to be in different phases of their life cycle. Some projects may be in their 'investment' period and other projects may have entered their profit contribution phase already (BT, 2007). Financial capabilities adequate to meet the scale of costs in the initial phase where most of the contracts are in their 'investment' phase are required. Over time, more mature projects may be financing those in their initial phases. Also, payment may not be made until the system works rather than when it is delivered and installed.

In addition to the life cycle financing problem, profitability is affected by the overall operational efficiency of the company, and much of this efficiency is based on standardisation of processes and the refinement of repeatable solutions. As already noted in this section, repeatable solutions are very dependent on identification of systems, processes and interfaces that are re-usable in subsequent projects. The balance between repeatability/standardisation and flexibility is at the heart of the platform approach. Other operational

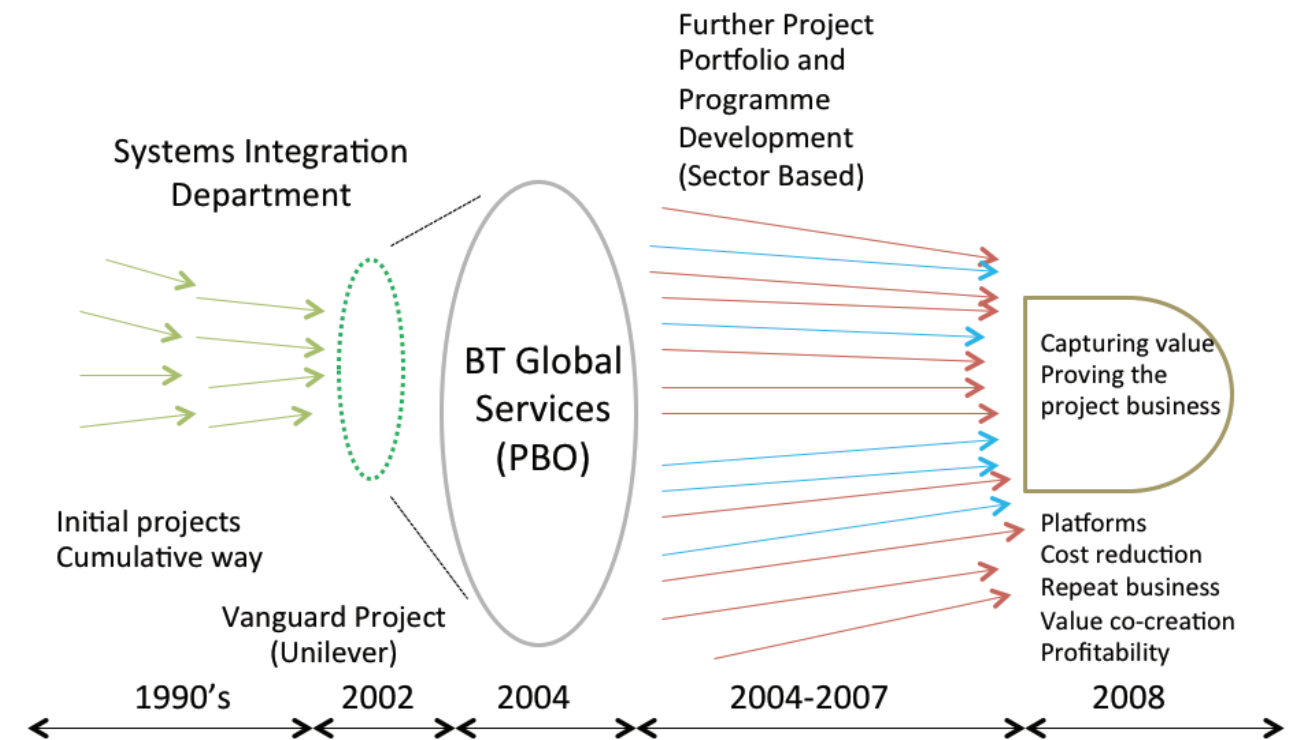


FIGURE 3. The evolution of the business of integrated solutions at BTGS. Source: Author's own elaboration

cost savings approaches are possible through reductions in the number of staff and in global procurement.

Some contracts may never reach the profitability phase. Thus, such 'toxic' contracts may exist in the portfolio, and these may hinder the performance of the firm in the medium and long-term (Ovum, 2008). Poor results from BTGS in 2008 (BTGS was officially established in 2003) demonstrate that this business model is difficult to deliver. One of the reasons for the poor performance may be the offering of more technical/commercial flexibility that underestimated the risks for the provider (BTGS), and this process must be refined throughout the years in order to have a better balance between the technical/commercial flexibility for the customer (following the customer focus approach) and the need for profitability and growth of the provider. However, the continuous refinement over a number of years assumes that the current integrated solutions business model adopted by BTGS is the right one. Eventually the long-term partnership

and contract resigning may prove unfeasible and BTGS may have to switch to other types of business model in its search for a viable business position, for example, a switch to more 'forced' solutions such as the business models that Oracle and SAP have found to be more feasible over the long term.

6. Discussion and Managerial Implications

Although the theoretical framework (shown in Figure 1) was useful to collect and organise the empirical data, there are some remarkable differences to what actually happened in practice within the case of BT Global Services in terms of project and innovation management processes. Figure 3 shows a summary of the main empirical findings.

The theoretical framework shows the logic and rationale of both innovation and project portfolio processes.

However it misses some important points that may happen in practice and that are not easily captured by the theoretical framework. These missing points may have a significant impact on the managerial processes and decision-making.

One aspect that is not captured by the theoretical framework is the evolutionary process of building up projects, starting with a 'niche', here understood as a set of projects within a departmental unit (systems integration department). These projects accumulate and when they achieve a certain degree of success, the next step is winning a vanguard project that makes feasible the business of integrated solutions. In the case of BT, the vanguard project was the one contracted by Unilever in 2002 (explained in Section 3.1), and this made possible the establishment of BT Global Services as a project-based organisation in 2004 to deliver integrated solutions to large customers. The business of integrated solutions of BTGS comprised several types of projects (as shown in Sections 4 and 5). There was

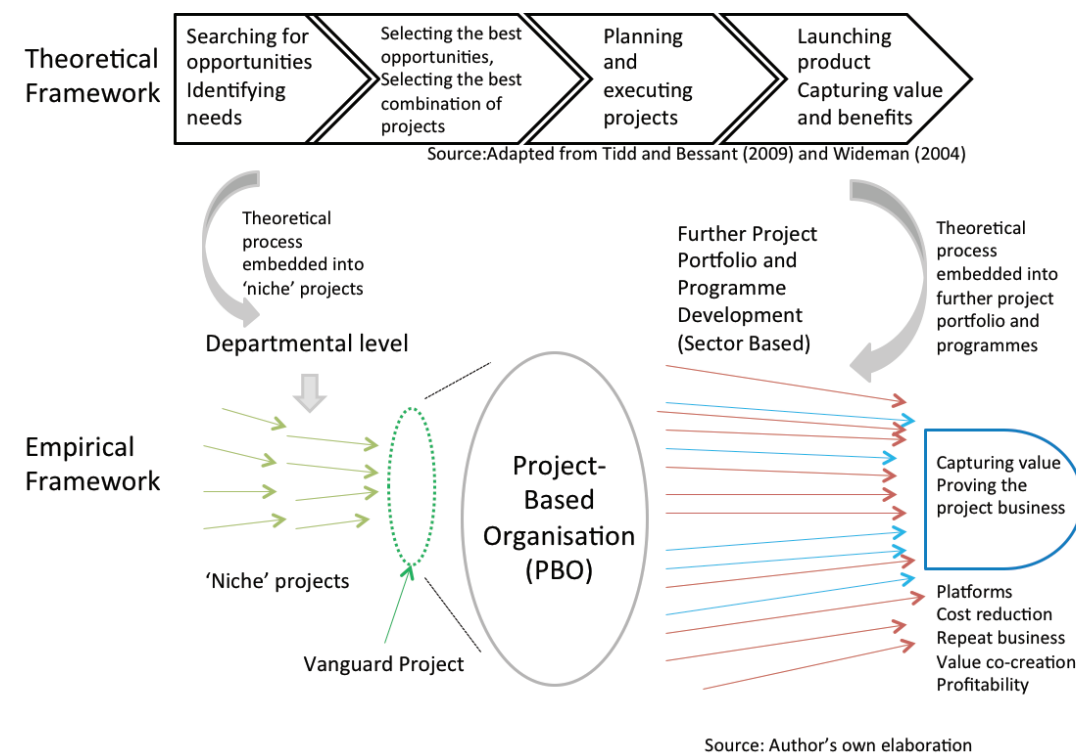


FIGURE 4. Relating the Theoretical and Empirical Frameworks

a period between 2004 and 2007 where a portfolio of projects was managed comprising several sectors (such as energy, oil & gas, healthcare, etc. according to **Table 1**). In this period, the overall project portfolio under BTGS was operating under loss, when eventually in 2008 BTGS had its first profitable year. By the year ended 31st March 2014, BTGS had been operating profitably and it is the largest business unit within BT, responsible for 39% of BT's external revenue (BT, 2014).

This trajectory from 'niche'/initial projects to vanguard project, then to project-based organisation to project portfolio (*loss making*) until finally achieving profitability shows the evolutionary processes occurring in practice and which are not easy to capture initially through the theoretical framework. In order to achieve profitability various techniques and concepts were utilised such as cost reduction through the platform approach, repeat business (*re-signing contracts with the same customers pursuing long term partnerships*) and value co-creation with customers and other stakeholders.

Two main managerial implications can be derived from this case analysis, and which are not easy to grasp from the theoretical framework. One implication is the evolutionary nature of project business, where the theoretical framework can be applied in the different building phases of the project business.

In other words the theoretical framework is embedded within the niche projects (*when part of the Systems Integration department*) and later within the further project portfolio and programme development (*sector based*). But the theoretical framework is not capable of showing the evolutionary perspectives of developing the project business over time. The second implication is the risk associated to project business. BTGS did not have a profit (*as a business unit*) in the period between 2004 and 2007. This creates huge pressure on the survivability of the project-based organisation (BTGS), which many firms may not be able to cope with. In order to make the project business profitable, several initiatives need to be undertaken (*repeatable solutions for cost reduction, repeat business through re-signing contracts and identifying new projects within the same customer, and value co-creation with customers and other stakeholders*). This entails a change in the mindset of making business, which requires a more long term vision in order to foster long term partnerships with customers and stakeholders. This can be a radical change for some firms and which may be very difficult to implement.

Figure 4 shows the relationship between the theoretical and empirical frameworks, pointing out how the theoretical framework is embedded into different phases of the evolution of the project

based business, i.e. within the 'niche' projects phase (*departmental level*) and the further project portfolio and programme development (*project-based organisation level*).

The empirical framework shows the birth of a project-based organisation (PBO) as a business unit within the parent firm. The PBO comes as a consequence of initial 'niche' projects deployment at a departmental level and after securing a vanguard project, which makes feasible the business of integrated solutions projects. While and after establishing the PBO, the various subsequent projects may struggle until the PBO becomes profitable.

7. Conclusions

The crisis suffered in the early 2000s was reflected on BT's more humble and focused strategy. From a vision of 'to be the most successful worldwide communications group' (BT, 2000, p.1), BT moved to a customer-centric strategy, focusing on European customers with global presence.

Large firms such as BT struggle with the imperative of growth, hence innovation. Just some percentage of growth may represent millions or billions of pounds of additional revenues. Even large firms may not have enough resources to obtain those additional revenues from their own new products and services. They need to rely on new uses and applications of their existing technologies, products and services.

The research question 'how have integrated solutions emerged as a significant business model for the business transformation of incumbent telecom operators?' is addressed by the empirical framework of **Figure 4**. Of course this applies to only BT in this paper, and further research needs to be done in order to confirm and/or improve this framework looking into other incumbent telecom operators.

The second research question 'how do integrated solutions reconcile project management (*with its constraints*) and innovation management (*with its openness*)?', enabled to verify through the theoretical framework of **Figure 1** that innovation management and project portfolio management have similar frameworks that can be combined and reconciled. Integrated solutions offer an adequate locus or arena for both project management and innovation management to co-evolve and flourish.

However, the business of integrated solutions is not so straightforward to implement and it is in fact a very risky type of business. Thus the third research question 'Are integrated solutions a feasible business model for incumbent telecommunications operators?' requires further considerations. Although BT

(during its years of crisis in the early 2000s) and IBM (in the mid 1990s) experienced the same dilemma of whether they should be split and sold, or whether it should remain as one firm, both BT and IBM were able to remain as one firm. This echoed the underlying idea that innovation is an end-to-end process. In the business of integrated solutions projects, splitting the firm may make innovation lose power. When large firms intend to deliver innovation to large customers, size matters, particularly if rapid and large scale developments must be undertaken (Neely, 2009). And that is the essence of integrated solutions projects for BTGS: understand customer needs and offer the best solution possible using one's own and/or third party partial solutions, and in the process, achieve customer lock-on.

The BT Global Services case shows how BT is taking advantage of integrated solutions projects to emerge from crisis and achieve future growth targets. The profitability of the business of integrated solutions projects relies on a challenging and risky business model. Projects start to deliver profits only after a few years from the start of the project (*usually three years*), and its profitability is also highly dependent on the renewal of contracts, i.e., on long term relationships. Thus the business of integrated solutions projects goes beyond selling integrated products and services. It is about building relationships and trust, in a culture where the service-dominant logic prevails. The development of capabilities in professional services (*i.e. consultancy, systems integration, project management and outsourcing*), underpinned by network and IT products, requires major investment by BTGS.

The business of integrated solutions projects represents another instance of the innovation strategy being implemented by BT through repeatable solutions in order to reduce cost, improve time-to-market and improve customer experience and empowerment. This type of business provides customers a great deal of flexibility, which needs to be supported by the flexibility embedded within the provider (*i.e. BT*).

Driven by an innovation strategy, BT set up BTGS in order to deliver integrated solutions projects to large firms. These projects in turn offer a unique position for BT to profit from tacit knowledge about customer needs and wants, innovating for the customers and feeding back to BT's innovation strategy. This facilitates BT's long term planning in a very competitive and turbulent environment.

In terms of managerial implications, the empirical framework offers a more realistic and accurate view of what actually happens in practice. The theoretical framework continues to be valid, but when compared to the empirical framework, some limita-

tions can be observed. One of them is the evolutionary trajectory of building the project business that is not evident when looking at the theoretical framework, but very evident in the empirical framework.

The empirical framework may help managers and decision-makers not to underestimate their efforts in building a business of integrated solutions. Another limitation is the lack of awareness of the high level of risk that the business of integrated solutions may impose on the business as a whole. As it is possible to see in the empirical framework, some years were needed for BTGS to achieve profitability, and several processes, tools and techniques were needed in order to prove the feasibility of the business (*such as platform approach, repeat business, and value co-creation with customers and stakeholders*).

The aforementioned conclusions were obtained analysing the case of BT Global Services within BT. As further research, other incumbent telecom operators can be examined in terms of how they have been building their own business of integrated solutions.



authors



Carlos Eduardo Yamasaki Sato BSc Computer Systems Engineering (1991) – Aeronautics Institute of Technology (ITA – Sao Paulo – Brazil); Postgraduate Diploma in Computer Networks and Distributed Systems (1994) – Pontifical Catholic University (PUC – Parana – Brazil); Postgraduate Diploma in Industrial Management (1999) – Federal University of Parana (UFPR – Parana – Brazil); Executive MBA in Project Management (2001) – Getulio Vargas Foundation (FGV – Parana – Brazil); MPhil in Technology Management (2004) – Federal University of Technology of Parana (UTFPR – Parana – Brazil); Postgraduate Certificate in Teaching and Learning in Higher Education (2008) – University of Sussex, UK; Ph.D. in Technology and Innovation Management (2010) – University of Sussex/SPRU, UK. R&D Engineer (1992-1995) at Equitel Telecommunications Ltd (Siemens Germany subsidiary company in Brazil); Systems Engineer and then Head of Department and Project Manager (1995-2002) at Furukawa Industrial S/A (Furukawa Japan subsidiary company in Brazil); Consultant in Project Management and Software Development (2002-2004) at LACTEC (a Brazilian Research Institute in the energy sector); Co-Founder and Consultant in Project Management (2002-2005) at PM21 – Solutions in Projects (Brazil); Lecturer in Management (2006 to present) at the University of Sussex/SPRU (UK).

Akbar, H., & Mandurah, S. (2014). Project-conceptualisation in technological innovations: A knowledge-based perspective. *International Journal of Project Management*, 32(5), 759-772.

Artto, K., Kulvik, I., Poskela, J., & Turkulainen, V. (2011). The integrative role of the project management office in the front end of innovation. *International Journal of Project Management*, 29(4), 408-421.

Artto, K. A., & Wikstrom, K. (2005). What is project business? *International Journal of Project Management*, 23, 343-353.

Barker, C. (2008). BT Global Services head resigns. *Silicon.com*.

Barraut, F. (2006). Presentation by François Barraut, President BT International, BT Global Services, on 14th September 2006.

Biedenbach, T. (2011). The power of combinative capabilities: Facilitating the outcome of frequent innovation in pharmaceutical R&D projects. *Project Management Journal*, 42(2), 63-80.

Brady, T., & Davies, A. (2004). Building Project Capabilities: From Exploratory to Exploitative Learning. *Organization Studies*, 25(9), 1601-1621.

BT. (2000). BT Annual Report 2000. London: <http://www.btplc.com/report/1999-2000/> accessed on 27 Feb 2009.

BT. (2005b). BT Annual Report 2005: <http://www.btplc.com/Sharesandperformance/Howwehavedone/Financialreports/Annualreports/AnnualReports.htm> Accessed on 31 May 2005.

BT. (2006). Long term partnership enables Scotland’s capital to transform service delivery: the City of Edinburgh Council case study. London: BT Global Services Case Study.

BT. (2007a). Case Study Barclays Africa: IP in the heart of Africa. London: BT Global Services Case Study.

BT. (2007b). Land registry increases efficiency and improves customer service: Land Registers of Northern Ireland case study. London: BT Global Services Case Study.

BT. (2007c). A public private information management partnership is enhancing public safety in Scotland: Disclosure Scotland case study. London: BT Global Services Case Study.

BT. (2007d). Shaping new markets in the digital networked economy: Visa CEMEA case study. London: BT Global Services Case Study.

BT. (2014). BT Annual Report 2014. London: http://www.btplc.com/Sharesandperformance/Annualreportandreview/pdf/2014_BT_Annual_Report.pdf Accessed on 27th August 2014.

Burns, T., & Stalker, G. M. (1961). The Management of Innovation. London: Tavistock Publications.

Bygstad, B., & Lanestedt, G. (2009). ICT based service innovation: A challenge for project management. *International Journal of Project Management*, 27(3), 234-242.

Calamel, L., Defelix, C., Picq, T., & Retour, D. (2012). Inter-organisational projects in French innovation clusters: The construction of collaboration. *International Journal of Project Management*, 30(1), 48-59.

Cameron, N. (2006). Presentation by Neil Cameron, CIO, Unilever on 14th September 2006.

Cassiman, B., Di Guardo, M. C., & Valentini, G. (2009). Organising R&D Projects to Profit from Innovation: Insights from Co-opetition. *Long Range Planning*, 42(2), 216-233.

Chandrasekaran, A., Linderman, K., & Schroeder, R. (2014). The Role of Project and Organizational Context in Managing High-tech R&D Projects. *Production and Operations Management*, in press.

Chesbrough, H. (2003). Open Innovation: The New Imperative for Creating and Profiting from Technology. Massachusetts: Harvard Business School Press.

Christensen, C. M. (1997). The Innovator’s Dilemma: When New Technologies Cause Great Firm to Fail. Massachusetts: Harvard Business School Press.

Craig, T. (2006). Presentation by Tom Craig, President, IP Networking, BT Global Services, on 14th September 2006.

Davies, A. (2003). Are Firms Moving “Downstream” into High-Value Services? In J. Tidd & F. M. Hull (*Eds.*), *Service Innovation: Organizational Responses to Technological Opportunities & Market Imperatives*. London: Imperial College Press.

Davies, A. (2003). Integrated solutions: the changing business of systems integration. In A. Prencipe, A. Davies & M. Hobday (*Eds.*), *The Business of Systems Integration (pp. 333-368)*. Oxford: Oxford University Press.

Davies, A. (2004). Moving base into high-value integrated solutions: a value stream approach. *Industrial and Corporate Change*, 13(5), 727-756.

Davies, A., & Brady, T. (2000). Organisational capabilities and learning in complex products and systems: towards repeatable solutions. *Research Policy*, 29, 931-953.

Davies, A., & Hobday, M. (2005). The Business of Projects: Managing Innovation in Complex Products and Systems. Cambridge: Cambridge University Press.

Frederiksen, L., & Davies, A. (2008). Vanguard and ventures: Projects as vehicles for corporate entrepreneurship. *International Journal of Project Management*, 26(5), 487-496.

Freeman, C., & Soete, L. (1997). The Economics of Industrial Innovation (*3rd ed.*). London: Pinter.

Govindarajan, V., & Trimble, C. (2010). The Other Side of Innovation: Solving the Execution Challenge. Boston Harvard Business School Publishing.

Green, A. (2006). BT Global Services Update 2006. Presentation by Andy Green, CEO of BT Global Services on 14th September 2006.

Henderson, R. M., & Clark, K. B. (1990). Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 35, 9-30.

IBM. (2006). IBM Annual Report 2006. Armonk, New York: IBM.

Jetter, L. (2003). Disconnected: deceit and betrayal at WorldCom. Hoboken, New Jersey: John Wiley & Sons, Inc.

Kapsali, M. (2011). Systems thinking in innovation project management: A match that works. *International Journal of Project Management*, 29(4), 396-407.

Keegan, A., & Turner, R. (2002). The Management of Innovation in Project-Based Firms. *Long Range Planning*, 35(4), 367-388.

Kerzner, H. (2006). Project Management: A Systems Approach to Planning, Scheduling and Controlling (*9th ed.*). Hoboken, New Jersey: John Wiley & Sons, Inc.

Leal-Rodriguez, A. L., Roldan, J. L., Ariza-Montes, J. A., & Leal-Millan, A. (2014). From potential absorptive capacity to innovation outcomes in project teams: The conditional mediating role of the realized absorptive capacity in a relational learning context. *International Journal of Project Management*, 32(6), 894-907.

Lowendahl, B. R. (2005). Strategic Management of Professional Service Firms (*3rd ed.*). Copenhagen: Copenhagen Business School Press.

Maister, D. H. (1993). Managing the Professional Service Firm. New York: Free Press.

Maylor, H. (2010). Project Management (*4th Edition ed.*). Harlow: Pearson Education Limited.

Meredith, J. R., & Mantel, S. J. (2006). Project Management: A Managerial Approach (*6th edition ed.*). Hoboken, NJ: John Wiley & Sons, Inc.

Neely, A. (2007). The Servitization of Manufacturing: An Analysis of Global Trends, 14th European Operations Management Association Conference. Ankara, Turkey.

Neely, A. (2009). Exploring the Financial Consequences of the Servitization of Manufacturing. *Operations Management Research*, 1(2), 103-118.

Oliva, R., & Kallenberg, R. (2003). Managing the transition from products to services. *International Journal of Service Industry Management*, 14(2), 160-172.

Ovum. (2008). BT Global Services Suffers. Retrieved 07th December 2008

Parast, M. M. (2011). The effect of Six Sigma projects on innovation and firm performance. *International Journal of Project Management*, 29(1), 45-55.

Sato, C. E. Y. (2014) Platform Leadership of Incumbent Telecommunications Operators: the Case of BT 21st Century Network (*BT21CN*). *International Journal of Innovation Management*, Vol. 18, No. 2, pp. 1450015-1 to 1450015-37.

Shenhar, A. J., & Dvir, D. (2007). Reinventing Project Management: The Diamond Approach to Successful Growth and Innovation. Boston: Harvard Business School Press.

Soderlund, J. (2008). Book review: The Business of Projects - Managing Innovation in Complex Products and Systems by Andrew Davies and Michael Hobday. *Technovation*, 28(10), 709-710.

Taylor, J. E., & Raymond, L. (2007). Innovation Alignment and Project Network Dynamics: An Integrative Model for Change. *Project Management Journal*, 38(3), 22-35.

Tidd, J., & Bessant, J. (2009). Managing Innovation: Integrating, Technological, Market and Organizational Change (*4th Edition ed.*). Chichester: John Wiley & Sons, Ltd. .

Tushman, M. L., & Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative Science Quarterly*, 31, 439-465.

Vandermerwe, S. (2003). Getting “Customer Lock On” Through Innovation in Services. In J. Tidd & F. M. Hull (*Eds.*), *Service Innovation: Organizational Responses to Technological Opportunities & Market Imperatives (pp. 55-80)*. London: Imperial College Press.

Vandermerwe, S., & Rada, J. (1988). Servitization of business: Adding value by adding services. *European Management Journal*, 6(4), 314-324.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, 68(*January 2004*), 1-17.

Wideman, R. M. (2004). A Management Framework for Project, Program and Portfolio Integration. New Bern, N.C.: Trafford Publishing.

Wise, R., & Baumgartner, P. (1999). Go downstream: the new profit imperative in manufacturing. *Harvard Business Review(September-October)*, 133-141.