
Trial by market: the Brightstar incubation experiment

Simon Ford* and David Probert

Centre for Technology Management,
Institute for Manufacturing, University of Cambridge,
17 Charles Babbage Road, Cambridge, CB3 0FS, UK
E-mail: sjf39@cam.ac.uk E-mail: drp1001@cam.ac.uk
*Corresponding author

Abstract: Established firms accumulate a significant body of knowledge, expertise and capabilities that are often secondary to their central revenue generating activities. How do they leverage this expertise in non-core technology into future value creation opportunities? In this paper we examine an attempt by the telecommunications firm BT to create value from the accumulated knowledge within its laboratories by setting up an incubator. While conceived by the board as a mechanism for leveraging the value of non-core technology into the workplace, corporate support for the incubator was withdrawn after only three years and prompted the incubator to partner with a venture capital firm, NVP, in the spin-out of ventures. Through analysis of this single case we observe how entering into such a relationship reduces the transaction costs of accessing complementary resources, capabilities and competences, while simultaneously reducing a number of the risks associated with venturing for both parties. Partnering with the venture capitalist allows the established firm to get its intellectual property into the market, for it to be tested by the market and further developed.

Keywords: corporate incubator; technology incubation; corporate entrepreneurship; corporate spin-out; business model; industrial ecosystem.

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Biographical notes: Simon Ford is a Research Associate at the Centre for Technology Management, University of Cambridge. He was an AIM Research Fellow on the Innovation and Productivity Grand Challenge from 2007–2009, during which he focused on how established firms generate breakthrough innovations. His current research activities include the development of a tool to assist firms with technology acquisitions, and understanding the complex co-evolutionary dynamics underpinning industrial emergence.

David Probert is currently the Head of the Centre for Technology Management, University of Cambridge. He pursued an industrial career with Marks and Spencer and Philips for 18 years before returning to Cambridge in 1991. His research interests include technology and innovation strategy, technology management processes, technology valuation, technology intelligence and software sourcing. His publications include the IEE books *Developing a Make or Buy Strategy for Manufacturing Business*, *Technology Management Assessment Procedure* and *T-Plan: The Fast Start to Technology Roadmapping*.

1 Introduction

Major discontinuous technological change is never far away and for established firms it is only a matter of time before the skills and competences they have accumulated are challenged. Firms recognise the imperative to innovate, with the majority having specialist R&D units specifically to promote technological innovation. The strength of such R&D units has traditionally been viewed as being in incremental innovation, in the development of modifications and refinements to existing products and processes, rather than in their ability to generate breakthrough innovations (Prahalad and Hamel, 1990). Despite this view, there are innumerable cases of established firms successfully developing radical innovations (e.g., Methé et al., 1996). However, the process through which large firms develop radically different technologies remains problematic; they often exhibit strong internal resistance to change and inertial forces prevent the generation and propagation of novelty (Ahuja and Lampert, 2001).

Searching for mechanisms through which they can overcome these barriers, established firms have turned towards corporate entrepreneurship as a means of tapping into the knowledge accumulated within its own boundaries and in external markets (Burgelman, 1983; Hornsby et al., 1993). Such approaches have become popular as they attempt to simulate the conditions conducive for entrepreneurial innovation and counteract the constraints which inhibit breakthrough innovation in large established organisations. The corporate incubator represents a particular form of corporate entrepreneurship in which, following the identification of fresh technological potential or market opportunities, new ventures are created based on the resources of the parent firm. The strategic purpose of such incubators differs from firm to firm but in many instances the eventual result is for the venture to be spun-out from the incubator. Difficulties arise during this process however, as despite these new ventures having developed market-ready technologies, they often still face the problem of obtaining external funding for spin-out.

This paper focuses on a single case study of a corporate incubator at the UK-based telecommunications firm BT (formerly British Telecom). During the late 1990s BT began to recognise that it was having only moderate success with the commercialisation of new discontinuous technologies that it had developed. Formed at the height of the millennium technology boom, the initial motivation for the incubator's existence was to monetise some of the latent technological assets within the BT laboratories. Brightstar was set up to identify technologies and ideas within the BT laboratories, and then provide the resources for these ideas to become fully fledged ventures before spinning them out. Yet just as ventures housed in the Brightstar incubator were beginning to gain revenues, the market crisis of the time caused financial restructuring and corporate support for the incubator was withdrawn. This withdrawal prompted the Brightstar management team to revise their strategy and led them to engage in a partnership with a venture capital firm, New Venture Partners (NVP).

While the lack of demonstrable profitability makes the success of the incubator debatable, the case shows the emergence of a new model of corporate innovation in which working in partnership with a venture capitalist provides the firm with the ability to trial technologies in the market. Accordingly, this case is of interest to scholars of entrepreneurship as the Brightstar incubator transitioned to new operating modes, with the partnership between the corporation and venture capitalist of particular significance. In this paper we aim to provide insights into the motivations and benefits of this

partnership and to better understand some of the longer-term effects of spinning-out ventures through the incubator.

2 Innovation in the established firm

During periods of incremental technological change the firm evolves organisational structures, architectures, routines and procedures that subsequently prove difficult to displace (Henderson and Clark, 1990). Chandy and Tellis (2000) have termed this “the incumbent’s curse”, describing how incumbent firms become “so enamoured with their success or so hampered by their bureaucracy that they fail to introduce the next generation of radically new products” (p.2). As a result, when faced with competence-destroying technological change, the technical performance of products developed by incumbents is often inferior to that of new entrant products (Cooper and Schendel, 1976).

As firms become larger, they also tend towards being more bureaucratic, leading to slower reactions to changes in market conditions and an averseness to risk (Mitchell and Singh, 1995). Consequently, established firms tend to under-invest in radical innovation (Henderson, 1993), fall into competency traps (Levitt and March, 1988), become constrained by core rigidities (Leonard-Barton, 1992), and remain overly committed to their primary customers (Christensen, 1997). These factors result in the view that established firms are less inclined towards producing breakthrough innovations. Yet large firms also have many advantages over smaller competitors; they enjoy economies of scale in research and development, they can diversify their risk and they also have greater access to financial resources (Ali, 1994).

2.1 Corporate entrepreneurship, incubation and spin-out

In the face of resistance to change and inertial forces preventing the generation of novelty, established firms have turned towards *corporate entrepreneurship* as a means of tapping into the knowledge accumulated within its own boundaries and in external markets (Burgelman, 1983; Hornsby et al., 1993). Corporate entrepreneurship is described as ‘the process of searching for and exploiting the entrepreneurial opportunities that arise from asymmetries of market or technological knowledge’ [Hayton and Kelley, (2006), p.423] and ‘the process by which teams within an established company conceive, foster, launch and manage a new business that is distinct from the parent company ... [leveraging] the parent’s assets, market position, capabilities or other resources’ [Wolcott and Lippitz, (2007), p.75]. This exploitation of new opportunities occurs either through starting new internal or external ventures or by transforming the organisation through strategic renewal (Guth and Ginsberg, 1990). Corporate entrepreneurship requires that firms take risks, be innovative and proactive (Miller, 1983), with superior market and financial performance the reward for assuming this risk (Zahra and Covin, 1995).

Corporate incubators represent one approach to corporate entrepreneurship. They are specialised corporate units that draw on the organisation’s resources to support the development of new internal and external ventures, enhancing a corporation’s technology base in such a way as to support its strategic development, growth and competitiveness (Hansen et al., 2000). The primary purpose of incubators is to provide a supportive

environment for new ventures in which they are protected from external pressures before they are ready (Peters et al., 2004). There are a number of features common to the majority of incubators:

- 1 shared office space
- 2 shared support services
- 3 professional business support
- 4 internal or external network provision (Bergek and Norrman, 2008).

Corporate incubators can be categorised according to their knowledge transfer mechanism or strategic objectives. In the former category, corporate incubators can be identified along the two dimensions of technology source (internal or external) and type of technology (core or non-core), and divided into the four categories of leveraging incubator (internal, core), fast-profit incubator (internal, non-core), in-sourcing incubator (external, core) and market incubator (external, non-core) (Gassmann and Becker, 2006). Alternatively, corporate incubators can be considered as a mode of internal corporate entrepreneurship, whose strategic objectives are to explore and/or exploit business opportunities. Incubators with the strategic logic of exploration invest in opportunities that arise inside the parent firm and actively nurture and develop these so that, over time, they become sources of growth for the firm. In contrast, incubators with the strategic logic of exploitation attempt to monetise the existing assets of the parent firm within a short time frame, frequently by spinning them out as new businesses (Hill and Birkinshaw, 2008).

The result of these corporate incubators attempts to exploit a firm's existing assets is the spin-out of new ventures based on the parent firm's assets. However, successful spin-out is not guaranteed because external investment is often required and fluctuations in the business cycle can significantly affect the market for such investment. Significant bodies of research have investigated investment in spin-out ventures, particularly those that originated from universities (Clarysse et al., 2005). Those studies concerning the spin-off or spin-out of new firms from corporate entities generally fall into one of two types:

- 1 those that arise from the strategic restructuring of existing businesses or division
- 2 those that are created from new knowledge sources within the parent firm (Parhankangas and Arenius, 2003).

Our interest in spin-outs falls in those of the latter category, the type also known as an 'assisted spin-out' as defined by Van de Velde et al. (2007) as those that are "well supported by their parent firm [and] which often result in a formal transfer of technology and knowledge from the parent to the spin-out" (p.12).

3 Methodology

In what follows we report on an inquiry into corporate efforts at BT to commercialise its intellectual property assets through a corporate incubator operating as a 'fast-mover incubator' (Gassmann and Becker, 2006) with the 'strategic logic of exploitation' (Hill and Birkinshaw, 2008). Through the use of a case exemplar, we explore the

motivation for operating in this mode, how the incubator's mode of operation evolved over time and how the incubator has contributed to the sustainable competitiveness of BT. A methodological exemplar does not seek to be representative. As the work of Penrose (1959) and Schein (1992) demonstrate, a rich single case study approach seeks to provide the basis for revealing theoretically interesting relationships and for conceptualising new constructs and aligning them with evidence. The Brightstar incubator is worthy of study because it was an incubator that faced closure at a time of significant market turbulence but which transitioned to two different operating modes.

The case history which follows is principally derived from ten interviews with individuals associated with the Brightstar incubator programme at Adastral Park. Each interview was between 30 and 105 minutes in length. The earliest interviews, those with David Brown, David Hands and Simon Garrett, were unstructured exploratory interviews. The seven interviews that followed these were semi-structured. This approach allowed questions to be posed that emerged from reviewing previous interviews and for further issues to be explored as they surfaced. Furthermore, archival material relating to the operation of the incubator was provided by Geoff Holdcroft and Nick Milner, along with the digital publication archives of BT, NVP and the spin-out firms. Supplementary literature from the business press has also been used to cross-reference these accounts.

Table 1 Interviewees

<i>Interviewee</i>	<i>Position(s)</i>	<i>Date(s) interviewed</i>	<i>Duration (minutes)</i>
Harry Berry	Co-founder, Brightstar partner, NVP	6/9/07, 5/10/07	65, 55
David Brown	Foresight manager, BT Group Corporate Technology Office	22/6/06	45
Anthony Finbow	CEO, Psytechnics, a Brightstar spin-out	16/8/07	30
Simon Garrett	IPR commercialisation manager, BT Exact Technologies	23/5/07	90
David Hands	Head of Perceptual Engineering, BT Group Corporate Technology Office	1/5/07	50
Geoff Holdcroft	External venture manager, BT Group Corporate Technology Office	17/7/07	85
Mike Hollier	Founder and CTO, Psytechnics, a Brightstar spin-out	6/11/07	45
Nick Milner	Former marketing manager, Brightstar	8/11/07	80
Chris Winter	Co-founder, Brightstar partner, NVP	23/8/07	105

4 The Brightstar case

In which follows we describe the origins of the Brightstar incubator, through its operation (2000–2003), to the partnership with NVP.

4.1 *The origins of Brightstar*

Around the time of the millennium, major discontinuous technological change was a serious challenge for incumbent firms operating in the ICT industry as wave after wave

of new entrants launched new technologies and competition intensified. One of these incumbents, the UK-based telecommunications firm BT, was faced with a number of significant challenges, including deregulation and internet telephony. There were concerns from within the firm that BT's R&D division, BT Exact, was not operating as effectively as it might and that few of the 300 new patents being generated each year were leading to commercial returns.

Seeking to rectify this problem, the board appointed a new chief executive of BT Exact, Stewart Davies, in 1999, with the task of improving the commercialisation of intellectual property emerging from the laboratories. Davies believed that there were cultural barriers within BT that prevented the development of more radical forms of innovation and that to exploit the latent IP required different operating mechanisms. After discussions with Harry Berry, a BT veteran with over 30 years of sales and marketing experience, Davies determined that a corporate incubator was the solution. The aim of the incubator would be to create and spin-out new ventures based on BT's intellectual property. He recruited Berry and Chris Winter, another BT veteran with technical experience, to head the incubator and 'to unlock the hidden value' in BT's research portfolio.

4.2 The Brightstar incubator

Brightstar was formally launched in February 2000. At first it had no physical premises, it was simply Berry and Winter touring the laboratories, listening to the scientists and engineers discuss their ideas. Together they looked at eight projects and discovered that while there were a great number of ideas in the laboratories, there was also substantial frustration that few of these were taken to market. Looking outside BT at other corporate incubators, such as Scientific Generics and TTP, they discovered that there was a very different environment within those incubators, one of excitement, which BT needed to replicate if it was going to be able to support new ideas. Following these investigations Berry reported to Davies that: "Yes, there is hidden value in Adastral Park, and yes, we can unlock it, but not with BT's money or BT's culture or BT's people" (Harry Berry, 1st interview).

Berry and Winter started a series of drop-in sessions in open-plan areas where BT scientists and engineers could freely discuss their ideas. Their approach attempted to create a buzz and generate excitement amongst the employees in the laboratories. While only four people turned up to the first session, soon more people were attending, to the extent that after 18 months there were around 25 people at each session. Conscious of the nervousness of the researchers, Berry believed that it was important to show encouragement and to emphasise that there were no bad ideas. At these sessions Berry and Winter would make suggestions to the ideas put forward, guiding their creators through the early concept stages until they were able to devise a two-page business plan.

At the same time as this discovery phase, Berry and Winter sought out external partners who could help provide funding and commercial expertise. Venture capitalists were identified and brought into the company to assist with selecting the best ideas based on these business plans. In addition, an advisory board composed of 80% non-BT people was created to determine which project groups would receive entry into the incubator and gain further funding. Those project groups that had already passed the business plan stage would go on to make a presentation to the advisory board. Ventures would be admitted into the incubator if they could:

- 1 state their objectives
- 2 show readiness for venture capital funding
- 3 show the potential ability to hit targets during incubation.

Once in the incubator, the venture would be provided with office space and some internal funding to pursue further development and market research.

By the end of 2000, four businesses had been launched by the incubator, with another 11 in the process of incubation. However, when the dot-com bubble began to burst in mid-2000, the market for venture capital evaporated and spinning-out technology firms became very difficult. To exacerbate the funding difficulties for Brightstar, BT had been on an acquisition spree during the 2000–2001 financial year, investing £14.5 billion in a range of global businesses. In doing so it made a loss of £1.81 billion for that year, the only year since its privatisation in 1984 in which BT has made an end-of-year loss. The lack of investment led Berry and Winter to look externally for other potential investment partners but were unable to find any at that time.

By mid-2001 the telecommunications industry was in a financial crisis and it had become a very tough market in which to operate. Unfortunately for the Brightstar ventures, they needed revenues from telecommunications firms at a time when these firms were least able and willing to make investments in new technologies. The lack of available investment prompted a strategic rethink. The incubator was transformed into an ‘accelerator’, with the function of bringing the ventures to market readiness more rapidly. The 11 ventures that were then being incubated were reviewed by the advisory board and the five that were deemed to have the greatest potential were retained, with the remainder discontinued. The five surviving ventures were given the task of generating revenues £25 million for 2002, if they could do so they would continue to receive support but would be terminated if they could not. Collectively achieving revenues of £31 million, they were much more successful than anticipated.

4.3 NVP Brightstar

Despite the successful revenue generation by the ventures, the accelerator had insufficient funds to support further technology commercialisation. Brightstar was in a position where the management team needed to decide if the ventures were going to be internalised or spun-out. Berry and Winter were continuing to look for external funding and in early 2003 they were introduced to a group called NVP.

NVP has its origins in the New Ventures Group (NVG) at Lucent Technologies, where it had been formed in 1997 to facilitate the more rapid development and commercialisation of its technology base (Chesbrough and Socolof, 2000). Set up as an internal venture creator, the group had successfully attracted \$350 million of equity capital between 1997 and 2001, enabling it to launch 28 new ventures. While successful, the NVG management team determined that it needed to gain independence from Lucent if it was to evolve the model further. They found an investor in Coller Capital, a global investor in private equity secondaries, which acquired an 80% stake in the NVG portfolio. The core NVG team left Lucent and in December 2001, NVP was formed. Following its spin-out, NVP continued to work with Lucent to bring new ventures to market. NVP had almost immediate financial success when in June 2002 it negotiated the sale of one of the ventures in its portfolio, Celiant, to Andrew Corporation in a deal worth

\$470 million. Financially secure, the sale allowed NVP to increase the scope of its investments and to investigate the potential for funding new ventures from technology-based firms other than Lucent.

NVP was looking to set up a European base in London as they expanded internationally. It was recognised that a partnership between NVP and BT could be mutually beneficial. The first stage of this partnership was the spin-out of Brightstar from BT in March 2003 as NVP Brightstar. At this stage Berry and Winter left BT to become partners at NVP. They retained an office at Adastral Park but now had the fresh challenge of launching the five Brightstar ventures as part of NVP's UK portfolio. After reviewing the five ventures that had been in the accelerator, they decided to spin-out four of them in April 2003:

- a.p.Solve: field workforce management software
- Azure: revenue assurance software and services
- Microwave Photonics: wireless access systems for mobile cellular infrastructure
- Evolved Networks: network planning systems

While BT contributed the technology and NVP the finance, the firms were then wholly owned by the NVP fund. This mode of operation was launched in 2004 and while initially known as NVP Brightstar, it is now simply known as NVP.

Following the launch of NVP Brightstar, the next stage in the new partnership was to begin to identify further ideas and technologies within the BT laboratories that could be developed as new ventures and funded by NVP for spin-out. NVP currently works with the BT corporate venturing team to discover those ideas and technologies within BT that might be brought to market together. Under the agreement contracted between BT and NVP, NVP have two rights:

- 1 'the right to roam', to take any technology from BT Group CTO, the research outputs of 500 people
- 2 the right of first refusal if the decision is made to venture a particular technology.

Under this model of operation, two ventures have been created, incubated and spun-out from BT. The first of these, iO Global Services, was spun-out in May 2005 and specialises as an intermediary in mobile media delivery. The second spin-out, Real Time Content, was launched in June 2007, and has developed an adaptive media platform that enables personalised online advertising.

5 Analysis: the Brightstar experiment

In this account we have described an instance of a fast-mover incubator, operating with the strategic logic of exploitation. The case study we have presented has described how the spin-out of new ventures from BT has been facilitated through partnering with NVP.

We have seen how the partnership first enabled the spin-out of the existing portfolio of incubated firms, and has subsequently been followed by ongoing discovery, development and spin-out. In the following sections we analyse the motivations for this partnership and the challenges facing the two organisations as they work together, before going on to examine the benefits to BT of operating in this mode.

5.1 Exposing ventures to external selection criteria

BT's business model was founded on the provision of a service to its customers through the exploitation of its installed infrastructure. Research within BT that could directly improve this service and provide improvements in performance or cost was supported. However, in cases where the technologies could not simply 'plug-in' to this portfolio, there was no overwhelming business case and the technologies were often shelved indefinitely. The incubator was set up as a way of identifying those latent technologies and ideas within BT, then forming ventures that could be grown within the incubator before being spun-out with BT taking an equity stake in the new venture.

In forming Brightstar, Berry and Winter sought to create an alternative selection environment to that which prevailed within the majority of the firm. They did not trust BT to be able to assess the market potential of ideas and thought it necessary to expose the incubated ventures to market scrutiny from their inception. "We didn't want BT people selecting the start-ups... We wanted external selection and didn't want corporates to make the selection" (Harry Berry, 1st interview). Bringing in these external perspectives and selection criteria was considered by Berry and Winter to be critical to the successful spin-out of the ventures. The advisory board comprising 80% non-BT personnel was a first step in this process. The external perspectives of these individuals formed the first filter, shaping the selection criteria that were applied to the ideas and research that BT scientists and engineers brought forward as proposals for new ventures.

The attitude the incubator took was that the ventures needed to be attractive to the market. Accordingly, external funding was also a prerequisite as each venture needed to be backed by venture capital for exit. This step was described this as 'the final market test' as "if a VC wouldn't back the project then they would close down the venture" (Harry Berry, 2nd interview). While this model worked initially, the problem with requiring external funding was that when the market for it dried up in the period following the technology crash, no further spin-outs were possible regardless of the viability of the venture. This prompted the reassessment of the incubator's operating model and the eventual decision to partner with NVP.

5.2 The BT-NVP partnership

5.2.1 Access to complementary resources, capabilities and competences

The rationale for the partnership between BT and NVP can be described as the need to access resources, capabilities and competences that are complementary to those that the firm already possesses. Partnering with NVP makes sense for BT because it gains access to NVP's financial resources and its capabilities in market insight and recognising venturability (defined by Geoff Holdcroft as "a venture's ability to provide a return to investors in a 3–5 year timeframe"). Similarly, the partnership gives NVP access to the wealth of technological discoveries and inventions that have been made and developed within the BT laboratories, along with the technical competences of its scientists and engineers. Such symbiotic relationships are common amongst technology-based firms and investment organisations (Katila et al., 2008). The distinctive aspect of this partnership is that rather than just a single investment in a new venture, it is an ongoing engagement and investment between the two firms in which both attempt to create and capture value through combining their resources, capabilities and competences.

5.2.2 Trust development

This ongoing partnership is important because the two firms have very different assets, internal processes and terms under which they are willing to engage in venturing activities. NVP recognises a number of these cultural differences, as evidenced in Table 2. Its response has been to attempt to smooth them out by having a common bridge between the two organisations, the Brightstar founders Berry and Winter, who left BT to become partners in NVP. As former BT employees, they are better placed to understand the challenges and frustrations that BT might have when dealing with an organisation that wants to operate on very different terms; they provide a similar translation function for NVP.

Table 2 Bridging the gap in spin-out venturing (adapted from internal NVP documents)

	<i>Corporation</i>	<i>Venture capitalist</i>
Assets	<ul style="list-style-type: none"> • Only the technology team, which lacks business development expertise • Usually no revenues, the R&D team has not defined or validated the market • Not commercially-hardened technology 	<ul style="list-style-type: none"> • Requires an investable business plan • The management team/CEO must be in place • Wants lead customers in place • Has a limited willingness to take technical risk
Process	<ul style="list-style-type: none"> • Needs a non-disclosure agreement • Can put a patient negotiating team in place • Has a cumbersome appeal process • Can't provide transition services 	<ul style="list-style-type: none"> • Don't sign non-disclosure agreements • Limited negotiation resources to engage in protracted deal discussion • Would not take risk of investing time in due diligence and not getting to the deal quickly • Typically have no incubation facilities
Terms	<ul style="list-style-type: none"> • Want narrow, non-exclusive IP license • Can't sign non-compete agreements • Reluctant to let people go • Wants to incorporate features to retain control • Driven by annual profit/losses (royalty model) • Would not fully fund to venture viability 	<ul style="list-style-type: none"> • Believe the venture should own all IP • Wants a non-compete agreement • Must take technical team • Fear agendas, would not accept limits on exits • Driven by five-year return on investment (equity model) • Royalties drain cash and limit exits

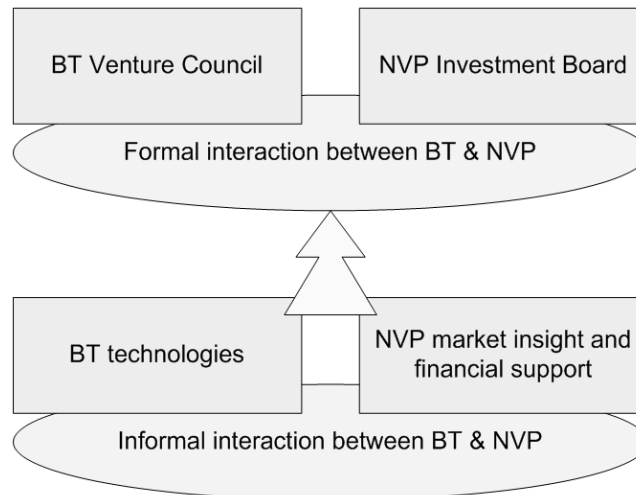
Having a consistent partner means that both BT and NVP reduce the transaction costs and risks associated with venturing. For BT this means that whenever it is considering the spin-out of a venture, it no longer needs to search for an investment partner as it already has one in place, so reducing its vulnerability to market fluctuations. This partnership reduces BT's risk in the venturing process, with the development of confidence in the venturability judgement of NVP leading to increasing levels of trust. Similarly, NVP's transaction costs are reduced because it has contractual access to BT's R&D laboratories, a proven source of cutting edge technologies, and can search within the R&D laboratories for inventions with significant growth potential. The increased familiarity with BT's

technologies and employees also de-risks the venturing process for NVP as it can more readily assess their potential and competences respectively.

5.2.3 Motivation alignment

In addition to possessing very different views on the nature of venturing, each firm has distinctive motivations for why they are investing their resources in these new ventures. For the corporation, the motivation is to commercialise some of its assets in an attempt to create businesses worth £100 million or more; for the venture capitalist it is to generate a return on its investment for its investors in a 3–5 year time frame. Acknowledging that these differences in motivation exist has led the two firms to develop a system for allowing the development of technologies for spin-out. The model used by BT and NVP is summarised in Figure 1.

Figure 1 Decision to spin-out a venture from NVP Brightstar incubation process



In this model, the process begins with relatively informal discussions between BT and NVP. In practice this interaction arises from NVP having identified a technology within BT that it believes has high venturability potential, and will be between NVP and the BT Corporate Venturing team. If these informal discussions are productive then more formal discussions will be held by the BT Venture Council and the NVP Investment Board. Both of these bodies must agree to the spin-out and the terms under which it occurs before any further actions are taken. In this manner, it is only those ventures that satisfy the distinct motivations of both BT and NVP that will be spun-out. The disadvantage of needing to satisfy the selection criteria of both parties is that it also reduces the scope for the types of ventures that can be spun-out, as evidenced by only two ventures having done so since the creation of the partnership in 2003.

5.3 *The consequences of Brightstar*

5.3.1 *Development of intellectual property*

As a large infrastructure-based service firm, BT's business model often makes it difficult for the technologies it is developing to be commercialised into products. This was the challenge facing a.p.Solve prior to its spin-out. While its workforce management software system was of great use in managing the work schedules of BT service engineers, the potential usage of this software extended far beyond BT. It was necessary for a.p.Solve to gain its independence so that it could also generate revenues from non-BT customers. Following spin-out it successfully did so, securing multi-million contracts in the UK with Centrica, E.ON, NTL and LogicaCMG. The investments that NVP made to the Brightstar ventures facilitated the spin-outs and as a consequence enabled the technologies to be tested in the market and be further developed. Allowing the venture to compete as an independent entity in the market allows BT to observe the market's need for the venture's technologies. That the ventures have been able to gain customer contracts or licensees is a signal that market needs were being unmet up to that point.

Creating the new ventures also enables the development of BT's intellectual property. Much of the IP generated within BT's R&D laboratories is underutilised and underdeveloped. Spinning-out the ventures with this IP incentivises the new ventures to develop the IP further as it is on this foundation that they will compete and that their revenues will be based. NVP's discovery process adds to this increased utilisation of IP. NVP's market insight provides an external perspective on BT's IP, identifying technologies that might not otherwise be further developed by BT's corporate selection environment.

That these ventures have valuable technologies and intellectual property has been demonstrated by the market's response. Of the four ventures that were spun-out from NVP Brightstar in 2003, two have subsequently been acquired by other firms and one has merged with another venture in the NVP portfolio.

- a.p.Solve: acquired by US firm @Road in February 2005 in a deal worth \$54.7 million in share issues and debt settlement.
- Azure: merged with the Indian firm, Subex, in June 2006.
- Microwave Photonics: acquired by another NVP portfolio firm, NextG Networks in February 2005; payment in share issues.

The fourth venture, Evolved Networks, remains in operation, as do the two ventures that were spun-out directly from BT with investment from NVP, iO Global Services and Real Time Content.

5.3.2 *Emergence of alternative business models*

The decision to 'open up' the BT Laboratories at Martlesham as Adastral Park occurred in the year prior to the launch of Brightstar and has provided the spun-out ventures with operating premises. The majority of ventures have remained geographically proximate to BT by basing themselves at Adastral Park, resulting in the growth of a telecommunications cluster around BT. As the ventures have been acquired or partnered

with external firms, these other firms have been brought into contact with BT and contributed to the expansion of the cluster.

Concurrent with the growth of a telecommunications cluster comprising the spin-out ventures and the firms that have often acquired them, has been the emergence of an alternative business model for BT. While the IP may not be of use to BT in its original form upon spin-out, following further development BT may discover that it provides a useful solution to a problem or opportunity that has arisen within its service operation. This has occurred as BT has discovered needs for the incorporation of many of these technologies into its service offering and become a customer of these ventures. Chris Winter describes the process through which the spin-out ventures develop BT's IP and then sell it back to them as 'federated research'.

"The idea was that some of your research was done in the start-up. Sometimes you spun a start-up out and it would pay a contract back to you and so you didn't think of a start-up as something that disappeared... It was part of the family of BT, of which you owned a different stake, you had a different relationship with. You had to grow up as an organisation and not be a control organisation." (Chris Winter)

Of the four NVP Brightstar spin-outs, three have engaged in this type of activity and become suppliers to BT:

- When it was spun-out, a.p.Solve already had a contract with BT to provide its workforce management software.
- In January 2005, BT contracted Evolved Networks to automate data migration, a contract that was extended in May 2006.
- Azure Solutions secured a contract with BT in February 2006 to provide inter-party billing as part of BT's switchless reseller service.

One of the two later ventures, iO Global Services, has also worked with BT, becoming a supplier of personalised digital content through the BT MyPlace scheme that started in London in February 2009.

It is notable that the two BT-NVP ventures that have not become suppliers to BT, Microwave Photonics and Real Time Content, have each relocated their headquarters to the US. In the case of Microwave Photonics this occurred following its acquisition by NextG Networks, while for Real Time Content it has been to improve access to target markets. This suggests that operating a corporate incubator in this spin-out mode can represent a form of dynamic capability when the spin-outs remain geographically close to the parent firm. The successfulness of this approach is dependent on the type of market the incumbent is operating in and its existing business model, it would appear to be more successful in BT's case because it is a service operator with an established infrastructure and it is close to its customers in the value chain.

6 Conclusions

In this paper we have examined how BT attempted to create value from the accumulated knowledge within the firm by setting up the Brightstar corporate incubator. We have observed how the incubator was initially setup as a 'fast-profit-incubator' of the type

defined by Gassmann and Becker (2006) and how its form has evolved over time. Gaining access to complementary resources, capabilities and competences is a well-established motivation for partnering and this case has been no different. We have observed how entering into such a relationship has reduced the transaction costs of accessing these complements, while simultaneously reducing a number of the risks associated with venturing for both parties. Despite the different strategic objectives and cultures of the two firms, mechanisms have been established that mediate for potential conflicts and provide opportunities for mutual value capture. Furthermore, there are also a number of additional benefits of the partnership for BT. Partnering with NVP brings external selection criteria into the firm during the discovery phase and when determining which ventures to spin-out. These selection criteria help counteract the prevailing selection environment within the firm that restricts innovation through exposing BT employees to market pressures.

Emerging from the incubation experiment and this ongoing collaborative approach, BT has obliquely arrived at, what is to them, a new mode of developing its intellectual assets: trial by market. Partnering with NVP has allowed BT to get its IP into the market, for it to be tested and further developed. This progressive approach to the management of its IP represents an emergent mode of R&D strategy in which the spin-out holds and develops the IP; there is then the potential for this to be later acquired or licensed by the parent organisation should it become so desired. The emergence of 'federated research' has opened up the possibility of buying-in technological solutions from other firms. This approach to open innovation implies that not only should a firm look externally for sources of innovation but that it can actively facilitate this process by seeding the market with the intellectual property it has itself developed.

This approach appears to be working for BT as some of the spin-outs have provided technological solutions it has needed. However, the nature of the business (an infrastructure-based service industry) and the unique period of turbulent change in which the episode occurred (the post-millennium technology crash), makes it difficult to know how such an approach would translate to firms operating with different business models and in different industries. While this single qualitative case is able to provide rich insights, it is limited by these contextualities. Furthermore, limited financial data means that the returns on investment from operating in this mode are not apparent. Accordingly, further research is necessary that explores longer-term interactions between corporate entrepreneurship initiatives and external investment agents that facilitate venture spin-outs. Such research should look to analyse the effectiveness of these types of partnerships, with quantitative studies used to determine the value creation and capture aspects of adopting these types of partnerships, and the successfulness of ventures that spin-out through these mechanisms.

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