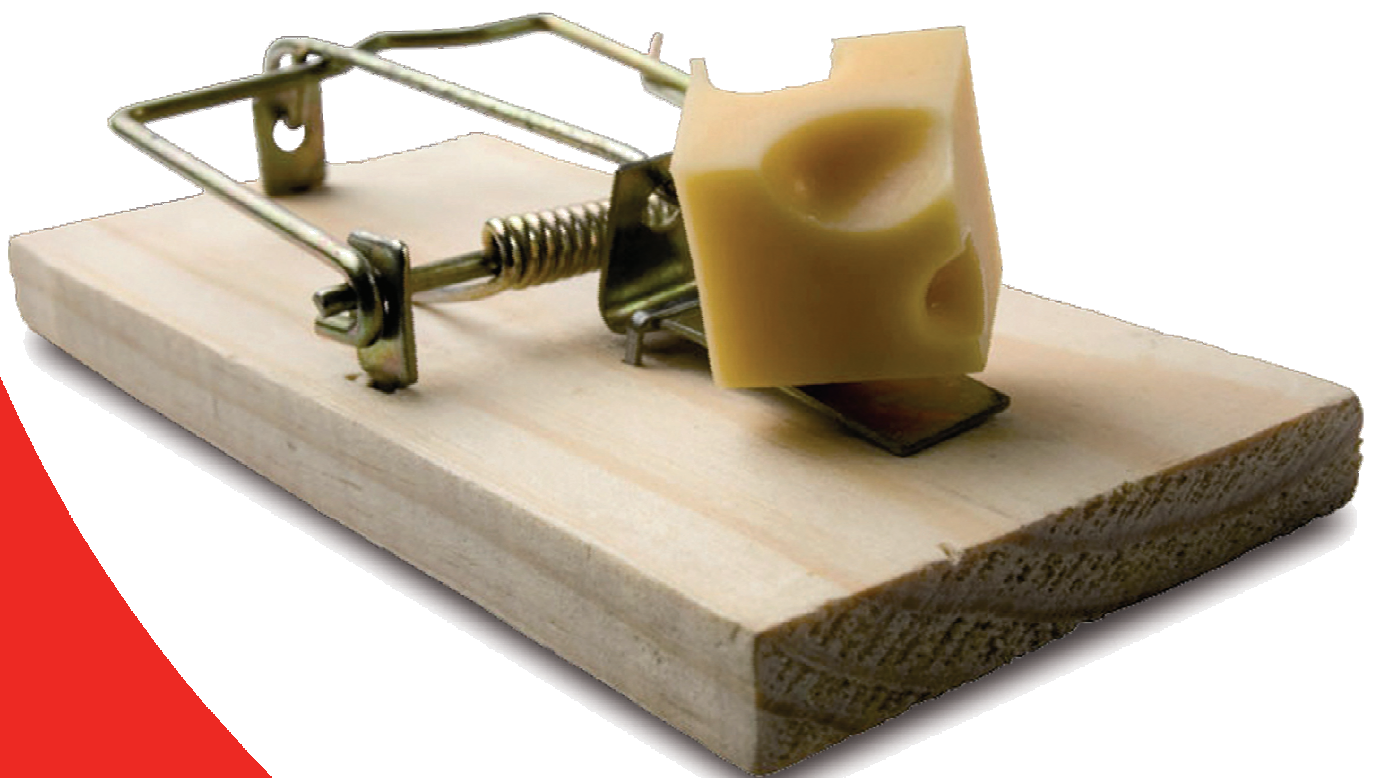


# Innovating with ICT

## The Executive Challenge

Dr Carsten Sørensen – The London School of Economics and  
Political Science

Robin Gear – PA Consulting Group, IT Innovation Unit



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Dr Carsten Sørensen is a Senior Lecturer in Information Systems in the Department of Management of the London School of Economics and Political Science (LSE).

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[www.carstensorensen.com](http://www.carstensorensen.com)

[www.lse.ac.uk](http://www.lse.ac.uk)

# Acknowledgements

## Researchers

Dr Carsten Sørensen, London School of Economics and Political Science Robin Gear, PA Consulting Group

## Interviewees

Paul Brindley, Head of Global IT, Cadbury Schweppes

David Key, Managing Director, Steljes Markets Ltd

Nick Butler, Group Vice President, Head of Strategy, BP

Matt Fahy, Group IT Director, Aviva plc

Stephen Parker, Director and Operations Manager, Impaq

Paul Myerscough, Head of European IS, Honda Motor Europe

Chris Dines, former CEO, Ovum

Andrew Barnes, Group IS Strategy and Assurance Director, United Utilities

Murray Bain, IT Director, NHS Direct

John Connolly, IT Strategy Director, Thames Water

Paul Coby, CIO, British Airways

Martin Sadler, Director Trusted Systems Laboratory, HP Labs Bristol

Daniel Kasimir, Director Corporate Affairs and Human Resources, Manpower

Jeff Roberts, IT Director, Norton Rose

Jonathan Smart, Innovation Director, Deutsche Bank

Andy Frith, Marketing Innovations Manager, British American Tobacco (BAT)

Bira Lima, Head Strategic Business System Group, British American Tobacco (BAT)

Mushtaque Ahmed, Head of Operations, JJ Food Service Limited

Ben Wishart, Group IT Director, Whitbread plc

John Murphy, Head of Business Solutions and Programmes, Marks & Spencer

Alan French, Head of Strategy and Architecture, Marks & Spencer

Stephen Warrington, Managing Director, Diamond Management and Technology Consultants

The survey was carried out in 2006–2007. All survey respondents were qualified by the researchers as to appropriate positions and responsibilities.

# Management introduction

Information and communications Technology (ICT) has long been the bad boy in the boardroom. Either too technically complicated or not significant in terms of strategy, it has failed to grab the attention of executives. The long and painful history of information and records automation will, for some, be seen as a necessary job, now largely done and commoditised. ICT can at last be outsourced and purchased like any other commodity.

Our research suggests that this is barely half the story. Far from being nearly over, the story of innovation with ICT has hardly started. Automation as an exclusive mindset is seen as constraining innovation and damaging competitive position. A new breed of ICT applications is emerging that reverse the trend towards simple automated encounters with customers. ICT is being used to enrich the relationship a business has with its customers by creating more adaptive and collaborative services at a reasonable price.

This report sets out the management backdrop to the need for innovative use of ICT. It identifies how the somewhat simplistic view of industrial engineering style management (management hierarchy, process control, time management, automation) is giving way to a more complicated mix, with pressure to:

- decentralise and localise, and at the same time centralise, standardise and regulate
- manage operations to extraordinarily high levels of reliability while at the same time make strategic changes in rapidly changing markets
- continuously improve processes and at the same time look for innovative step changes in performance.

Against this backdrop we identify four types of Information Services – computational, networked, adaptive and collaborative. The computational service has dominated traditional thinking about the role of ICT. This works well in centralised, stable businesses. It delivers cost savings but also has the potential to kill innovation.

However, pressure from customers is now forcing organisations to think about not just how they automate and reduce cost, but how they use ICT innovatively to build back value into the customer relationship. Customers (business and consumer) have bought into the potential for ICT to support an unexpected degree of intimacy in the customer relationship, through adaptive and collaborative information services. This can range from the say you have in building your car to the way you tailor and buy your insurance. As a consequence customers want services that offer the convenience and cost ICT can provide with the value of a relationship.

The potential to gain new strategic value from ICT rests on the ability of the organisation to use it not just to automate, but to deliver increasingly adaptive and collaborative services. The technology allows it – the explosion in internet based relationships (from Friends Reunited to eBay) has shown how receptive we now are to this style of engagement and how vital it is in fast moving markets. The key is in innovative thinking in applying it.

Pie in the sky it may be, but our view is that when faced with the choice between centralised bureaucracies and reasonably priced intimate, adaptive and collaborative organisations, customers and employees will vote with their mice.

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# 1 Does ICT matter for innovation?

September 2001 was not a good month for British Airways' newly appointed CIO Paul Coby and his team. Not only had no-frills airlines since the mid-90s challenged the existing airline business model. On September 11th the situation took a dramatic turn for the worse. For the 1600 people in the IT Department, innovation suddenly became a matter of life or death for the business. As he says "It was pretty much about standing and fighting".

A collective effort over the next few years saw a comprehensive programme of strategic, tactical and operational changes involving the entire business, and the turning of existing principles inside-out. BA embarked upon a process of simplifying both technological infrastructure and business processes and of adopting some of the no-frills airline principles; "we had to realise that we were selling baked beans in Tesco, we weren't selling Cartier watches, (although we do that as well!)". This involved a complete inversion of the business model – selling cheaper tickets to early buyers rather than using elaborate and complex price-plans; "we had a fare for dogs in boxes going to Budapest, or even better, World Cup referees. We had millions of fare combinations".

They pushed for the introduction of electronic tickets and set themselves targets of how large a proportion the ticket sales, customer support, and check-ins would be carried out over the ba.com website. As a result, Paul Coby argues, "in terms of the operational performance, we have improved it by 2.5-3 times on the measures for the key systems, compared to 2000 to 2001. At the same time we have taken 40% of the cost out by standardisation and simplification." He further argues that technology was used as "an anvil for simplification" and exemplified; "If you have 29 different choices from the database, that's no use. It's got to be really easy to use. As you put more and more on-line, so it forces you to be really clear about what the proposition is and to clean up your processes. And if you clean up your processes you begin to simplify the airline. You have got a happy virtuous circle."

Coby further argues that the big problem of legacy airlines is the cost of complexity and; "the world for our customers and our staff should be becoming simpler through the IT becoming more complex, we have put the complexity "under the IT bonnet". He provides the example of dynamic packaging where a simple interface will allow customers to dynamically construct their own packages combining flight, hotel and car-hire. "A very simple proposition but behind that simplicity are massively complex problems to solve in terms of inventory management to ensure you can sell these things."

This effort by BA over the past five years is a significant achievement and one Paul Coby is adamant to point out is a result of a company-wide effort where the concern for serving customers were at the centre of attention. The BA Information Management Department led by Paul Coby was in 2006 awarded the winner of the category Outstanding Contribution to UK IT.<sup>1</sup>



## 1.1 Innovation with ICT

This report deals with the strategic importance of ICT for organisational innovation and the role of senior executives in shaping this.

A well-published view consistently claims that Information and Communication Technology (ICT) is rapidly becoming a standardised commodity or utility and therefore loses its strategic importance in organisational innovation. In 2003 Nicholas Carr published the article *IT Doesn't Matter*, followed in 2004 by the less definitively titled book *Does IT Matter?*<sup>2</sup> These publications immediately created a heated debate. The IT industry largely denied recognising the premises, whilst the arguments rang true with many in the business community, especially for those outside IT functions.

However, there are plenty of examples where ICT has enabled businesses to innovate and radically change their strategic direction. In September 2001 the conditions for airlines changed and BA had to respond to this challenge. The solution was not a matter of purchasing an isolated system or even a complex enterprise infrastructure. Instead it was a matter of starting a process of fundamentally re-engineering BA's business. Complex internal processes were simplified and customer-enabled through ICT.

So does ICT matter for strategic business innovation or does it not? Unfortunately for executives tasked with managing ICT within the business, the answer is that both positions are true. The complex relationships between business processes, organisational structures and ICT support are not easily separated. Most business processes are in some form intimately supported by ICT so changes in one will affect the other. As Jonathan Smart, Innovation Director at Deutsche Bank, states; "We are 49% business, 51% IT".

Executives must increasingly respond across a more complex mix of challenges, ranging from those concerning critical details of the operation, to strategic choices on positioning; and also from immediate issues to those 2-3 years (and sometimes 5-20 years) ahead. In this mix, far from exclusively becoming commoditised, ICT is playing a diverse and often strategic role in supporting innovation and differentiation.

We present our paper in support of this conclusion in three broad sections:

1. Firstly, from our in-depth conversations with 22 senior executives from 20 organisations we review the way executives are thinking about innovation and competitive advantage and the challenges they face.
2. Secondly, based on these observations and on theoretical research we propose a model for organisation and deployment of ICT that supports the diversity of options for executives to link organisational requirements with ICT capabilities through information services.
3. Thirdly, we explore how the model helps executives manage investment in ICT more effectively to support innovation in a range of different application areas, from the apparently mundane, but difficult, improvement of processes to the less tangible use of ICT adapting to user needs, supporting networking and collaboration.

## 2 The role of the executive

Our interview evidence indicates that executives are being pulled a number of ways as they try to continuously improve and innovate at the same time.

Executives are grappling with tensions in three dimensions as the organisation becomes increasingly dynamic in response to market pressures:

- **Strategy vs operations** – the need to be excellent in operations while at the same time addressing dramatically shifting customer demands
- **Centralisation vs decentralisation** – the need to offer highly consistent services and at the same time look local
- **Improvement vs innovation** – the need to make continuous improvements while at the same time looking for step changes in technology, organisation and process that deliver new differentiation.

### 2.1 Strategy vs operations

David Key, Steljes Markets explains his role as; “I basically provide leadership through setting directions, providing clarity as well as energy and drive to make the team function.” Stephen Warrington from Diamond Management & Technology Consultants concurs; “My role here I see as creating the conditions for people to do what is necessary, leading by example where I am able to, and then putting into place through the right investment or through recruitment or other sorts of change, the capacity for people to do these right things.” As Nick Butler's role as Head of Strategy for BP implies; “[I] look at what we should do next. The next big opportunities. What is happening externally? Changing requirements. Changing standards. Competitive activity.”

Although the role of the executive is intrinsically linked with strategic foresight and leadership, it does not necessarily imply that their actual day-to-day activities are not highly practical and related to specific and current problems. Nor is the process one of only looking far ahead in the future.<sup>3</sup> Nick Butler explained that the two or three primary strategic issues he is pursuing at any point in time constitute a quite dynamic list, subject to sudden change as a result of events in the external environment. Chris Dines, former CEO Ovum, argues that his role as CEO is one of “making sure we keep a sense of direction and proportion to what we do”, which to a large part involves managing personal conflicts between strong-minded people and the difficult job of creating the right atmosphere and tone.

For Stephen Parker, Director and Operations Manager at the small software solution provider Impaq, it is essential to regularly sit down with selected programmers to keep up with the detailed decisions made during software development. Paul Coby, BA, makes a point of taking a specific detailed interest in key projects through briefings or by sitting in on project meetings, “because the trouble is that you can get too far away from the real business issues.”

Cadbury Schweppes Group CIO Paul Brindley characterises this apparent dichotomy between strategic and operational. He describes his role as aligning the IT strategy with the business strategy, but adds to this; “That’s my main role, but believe me, if the CEO can not make his Blackberry work, then I get a call. You can do a big ERP project with twice the functionality for half the price and at half the time, but if the senior managers can’t get their email, then you are in big trouble.”

This dichotomy can create considerable pressure. Executives are the figures to whom the rest of the organisation looks to for leadership, but also they also face mounting pressure to concurrently show leadership and relinquish power.<sup>4</sup> Decisive decisions are necessary for the organisation to engage in essential business model innovation.<sup>5</sup> However, with increasing complexity, much innovation relies on engaging and inspiring members of the organisation, partners and customers to participate in innovation. As argued by Daniel Kasmir, Director Corporate Affairs and Human Resources at Manpower, the pressure of modern organisations to deliver competitive products and services “puts the most enormous emotional and physical pressures on individuals”.

One of the main challenges facing modern businesses is to provide customers and partners with meaningful support where there is an expanding chasm between what is expected by the customers and the traditional logic for delivering support.<sup>6</sup> One study indicates that executives from more innovative firms separate themselves from their less innovative colleagues by being more likely to emphasise customer acquisition and retention, increasing sales volumes, new products and services, as well as increased flexibility and speed of response.<sup>7</sup> Reducing operating costs was not a distinguishing factor between the two categories of firms. Daniel Kasmir, Manpower, argues that it is essential for organisations to treat customer and employee satisfaction as one integral issue and that it; “will be about the value of innovation where employees enjoy selling and customers enjoy buying.”

## 2.2 Centralise or decentralise?

Traditional vertical command-and-control was effective in managing risks associated with early large-scale industrial activities. Business today, however, demands that organisational decisions be made not only through vertical command-and-control but also increasingly through the cultivation of horizontal collaboration, and ad hoc networks.<sup>8</sup> This leads to a complex mixture of centralisation and decentralisation that needs to be managed, much depending on the size and sector of the firm in question.

There is certainly pressure to decentralise. Increased complexity and the global reach of operations makes decentralisation of some aspects a necessity. As Chris Dines, former CEO of Ovum, illustrates “the reality is that most senior people in organisations don’t know all details about what their business is doing. It is horrendously complex.”

Nick Butler, BP, argues that the only way BP has been able to grow through a combination of increased centralisation and decentralisation. He elaborates that BP's business in Russia represents 10% of the company is bigger than the whole of BP was in 1996. He continues that: "Working in a far wider range of countries, you can't run every decision from St James Square so we have a management structure of really carefully managed delegation so the strategy sits here." He emphasises that whilst resource allocation is managed centrally, operations and delivery is fully decentralised to independent units. This implies that national BP executives engage in much broader issues; "so the head of business unit in Angola has to understand the politics of Angola as well as the engineering of particular off-shore platforms. They have to be an ambassador and indeed a lot of the team have to understand how to work in these complex areas." He emphasises the importance of each regional executive building local reputation and trust needed for managing their operations as an essential means of independently deliver the operational implications of the overall BP strategy on the ground.

Andrew Barnes, United Utilities, emphasised the need for a more decentralised and inclusive management style, as employees no longer accept the cascaded communication process of the past where information is filtered down through hierarchies; "People expect that if the organisation has something to say then they want to see, hear and question it when they want. The whole communication strategy is changing. People are not going to be in a push-model for communication but almost in a dialogue. We have created a mailbox for the CEO direct. Send him an email and say what do you think? It does not matter where in the organisation you sit."

Head of European IS for Honda Motor Europe, Paul Myerscough, explains his situation as; "I am in the Head Office and in my IT team there are four people. Two of those are from Japan, one is European. So in effect I have one direct report. But I have 450 indirect dotted line reports." Matt Fahy is in a similar organisational arrangement; "I am the group CIO for Aviva. It is a role that has almost no operational responsibility but determining the strategic agenda for deployment of IT in Aviva." This relates to the traditional discussion of where to place the responsibility for innovation, either in separate innovation and R&D units or throughout the organisation.<sup>9</sup>

Paul Brindley, Cadbury-Schweppes, explains the balance in relinquishing control in order to cultivate collaborative patterns, with that of establishing standardised and centralised decisions in order to effectivise and streamline the organisation; "you do not have direct command-and-control anymore. You are working far more across virtual teams – teams that are brought together just for specific projects. Also, you are getting very strong personal targets as to what you are expected to deliver. There will be regional targets of innovation and you will be measured against these. These for the business side would primarily be formulated in terms of growth of net sales volume outside core brand by a percentage basis points."

Yet our conversations with executives also revealed a need for standardisation and centralisation of business processes. Ben Wishart, Group IT Director at Whitbread, explains that a decentralised structure between eight individual brands had led to inefficiencies, as it was difficult to obtain economies of scale and promote rapid organisational learning across the eight brands. Centralising operations and thereby creating interdependencies between the individual business units had significant positive effects.

Stephen Warrington, Diamond Consultants, argues that the pendulum over the past two decades has swung from managers being well-regarded as competent and therefore bestowed with discretion and trust, towards increased scrutiny and corporate governance. He argues that this development is sensible in the light of examples of poor management, although it also creates a short-term environment with lack of trust and based on standard procedures. As he puts it; “So we can all tick the boxes on the governance sheet. We can comply with every regulation. We have always got an answer for what we are going to be asked tomorrow .... Success will in the end be about core values, which combine in the right way allowing executives to be trusted adequately, get on with things that by definition can be messy and complicated and for which there isn't a neat and tidy answer available at the analyst conference”.

Most executives are grappling with a mixture of centralisation and decentralisation.

Aviva, BAT, BP, Cadbury-Schweppes, and Honda have implemented organisational structures where essential strategic decisions are made in a central headquarters, with globally distributed branches supported with standardised and centralised decision and information management processes. However, the branches were to a large extent independent in much of their decision-making, and in the responsibility for translation of strategies into tactics and operations.

Executives from BAT, Honda and Aviva, all reported the importance of centralising the coordination of establishing a global ICT platform but at the same time recognising a great need for local variations. This, according to Bira Lima, Head of Strategic Business System Group at BAT, leads to ongoing discussions to “clearly define the boundaries of what is an enterprise concern, what is global concern and what is the freedom you have to operate in individual markets as there are areas where local markets can do what they want and where it's not relevant for the enterprise to be involved.”

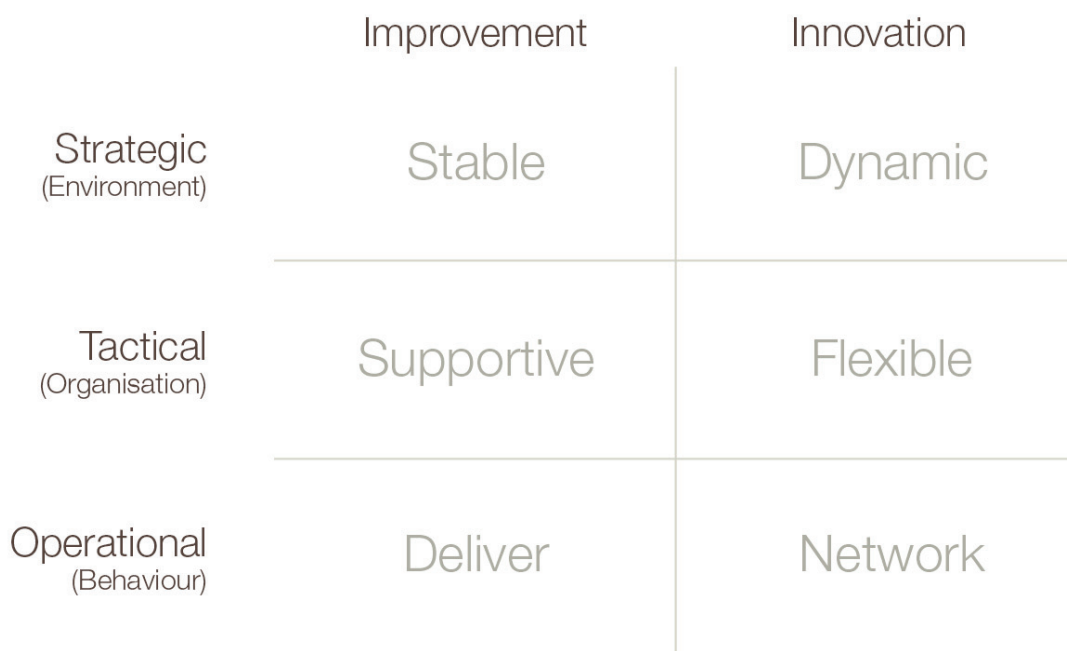
John Connolly, RWE Thames Water, explains his company's challenge in consolidating, standardising and unifying a corporate eco-system of independently developed bespoke IT systems supporting highly localised needs. The aim is to shape these systems into a unified supportive infrastructure to create a foundation for further enterprise service innovation; for example allowing the company to provide consistent information to customers based on a unified view of current status. In this case, localised innovation has delivered creative solutions to local problems, but also created the need for consolidation of a unified supportive system.

One of the essential aspects of managing centralisation versus decentralisation is clearly to gain the full advantage of governance in the former and flexibility in the latter. Decentralised networking in a culture of centralised control simply just leads to more meetings and frustrations for all involved.

## 2.3 Two survival patterns: improvement vs innovation

We can characterise organisational change in terms of two complementary survival patterns (see Figure 1).<sup>10</sup> Where once these modes would typically operate in series, executives are increasingly finding shorter timescales drive a need to run continuous improvement and innovation in parallel.

**Figure 1: The current challenge for executives is to facilitate continuous balancing of improvement and innovation survival patterns.**<sup>11</sup> ©Holmberg & Mathiassen 2004



The **improvement survival pattern** is based on the every-day efforts to simply become better at meeting customer demands and generate revenue to survive. At an operational level this implies a focus on delivery. At the tactical level, the organisation will then need to offer a supportive infrastructure making it possible to learn from one project to another and for the organisation to grow the appropriate professional practices.

The **innovation survival pattern**, on the other hand, implies dynamic strategy-driven innovation where the organisation survives through responding to rapid changes in the environment. This implies at the tactical level that the organisation pays less attention to establishing a solid infrastructure as this may be irrelevant a month ahead. Instead it must establish a flexible organisation ready for constant change. At the operational level the demands of strategy-driven innovation can only be met by networking behaviour allowing flexible reconfiguration of practices and relationships.

The **improvement and the innovation survival patterns** complement each other well but how they are implemented in specific organisational settings is highly critical as they easily conflict.

With increased global competition, it is no longer sufficient to choose one of the two positions; intelligent ways of mixing or balancing is essential. The role of executive decisions is to balance the need for establishing the experimentation that hopefully leads to innovation, and to establish supportive systems enabling the organisation to offer stability in its engagement with its customers and partners. This implies balancing between the extremes of too much or too little direction, too little or too much space, too strong or too weak boundaries, and too strong or too weak support.<sup>12</sup>

## 2.4 Choosing survival patterns

There is general recognition amongst our respondents of the challenge in striking a balance between creating stable processes of gradual improvements by putting procedures and systems in place, as opposed to more radically innovating the organisation through reacting to or even shaping emerging markets and technologies.

We found discrete examples within organisations of continuous improvement:

- Ben Wishart, Whitbread, argues that the hospitality sector will typically engage in incremental improvement as response to customers. He argues that the lower margins and a technologically less sophisticated sector than others implies that they can take a lead from situations where customers feel frustrated with their interaction with systems and services. He argues that Whitbread can foresee the increasing use of Internet booking, since purchase, and check-in of flight tickets from airline companies will lead to increased customer-demand for the same services for hotel bookings. At this point only part of this process is supported; “So to book, pay and check-in on the internet is the next thing for us. Also kiosk check-in and RFID tags on door keys so you can have a key for life, perhaps”. He argues that whilst the company takes a lead from customers, they must still seek to be responsive to secure competitive position.
- Daniel Kasmir, Manpower, describes the outlook for the recruitment sector in terms of rapid incremental steps as opposed to wholesale revolution. And thereby signals that one way of managing the two survival patterns is to speed up improvement efforts.

We also found discrete examples of innovation processes in operation:

- HP Labs represents a specific innovation-focused unit within HP and the way work is organised and managed resembles the innovation survival pattern almost entirely, with a highly dynamic innovation driven strategy and flexible organisation of work in loosely coupled networks with a large degree of individual discretion. Management decisions are in this context difficult to make, according to Martin Sadler; “The people you want in labs don’t take to being managed very easily. They want to do their own thing, they like to self-manage and their independent spirit helps drive innovation. But they do understand that they are going to be managed and cannot do just whatever they want. You need to keep it light touch so if you really have to say no, or be more directive, then you actually want them to agree because you only do it very, very occasionally”
- Steljes is a small and dynamic firm very much based on the innovation survival pattern. It seeks to embed experimentation and innovation in a closely defined decision process to ensure that essential organisational lessons are learnt from project to project. David Key, Steljes, argues; “It is very easy in a business like this to come along and say 'I have a great idea' and we have had



examples before this process where people nearly sold the business down the river. The process we have put in place is to prevent that. To really look very hard at these ideas and provide great rigour around them. Equally, within that process, allow entrepreneurs to go on. People often want to push things through quickly. But we have to be rigorous about it. Initially this may cause frustration but people also understand that it is a protection mechanism”.

- Paul Myerscough, Honda Motor Europe, says; “I used to have this view that innovation started in a playroom with lots of colourful stuff on the walls and some funny games but I don't anymore. That is a route to wasting a lot of time. For us innovation for example starts in the dealerships. What are the number one issues in the dealers out there? Or you can start with customers.”
- Stephen Parker, Impaq, explains the interactive innovation process that brought about the emergence of their portal product allowing customers to link directly into supplier systems.<sup>13</sup> They essentially relied on the sale and maintenance of an accounting package and saw how Microsoft and Sage acquired competitors and how SAP was moving into the SME space. As a way of formulating a strategy for innovation Stephen Parker engaged in a discussion with their existing customers and he discovered that some of them were getting pressured by their tier-one customers to provide direct access to internal systems; “that was interesting because we know SMEs, we understand the dynamics, we have got an accounting package which we can trial with some widget that will connect them to their customers. And that became the germ... If we want to be ahead of the game we have to keep going into a space where it is a bit uncomfortable, but that is part of the attraction to people who are left, to do stuff that is uncomfortable.”
- Daniel Kasmir, Manpower, points at the essential need to square the circle between executive decisions to meet internal and external demands for innovation. He argues that “employees need trust to be able to feel that they can innovate” and that “measures of customer and employee satisfaction should actually correlate to provide an indication and measure of innovation success in the sense that satisfied customers plus satisfied employees equals successful innovation”.
- For Andy Frith, BAT Marketing Innovations Manager, “organisational flexibility isn't just around innovation; it's about giving people a sense of ownership”.

Whilst we can identify clear evidence of survival pattern choice leaning towards either extreme of the two positions, the consistent message from our conversations with senior executives was that there is a general deep demand for mixing the two survival patterns in intelligent ways.

Andy Frith, BAT, argues that they need to balance the two concerns and generate consumer relevant innovations in a cost-effective and un-complex way. He also points out the potential danger of this complex mix as, for example, a two-year development cycle closely aligned to tactical considerations may miss broader opportunities for new transformational ideas leading to a better balanced innovation portfolio.



Matt Fahey, CIO at Aviva, highlights business changes from stable improvement to increased focus on essential innovation. The business of selling financial services has changed radically the past 20 years with an increased demand for regulation; “and when you think of Sarbanes-Oxley or some equivalent outside USA, then you see that it has an effect on how you run the business, what sorts of controls you have in place etc. That is one very big factor.” They are, however, also faced with customers demanding increasingly sophisticated means of interacting with the organisation; “In the past two or three years consumers have increasingly started to expect that they can interact with you in the same way as they interact with each other on MSN via Instant Messaging or on companies like eBay”.

HP Labs serves an essential purpose of feeding innovations to other HP business units as well as to networks of partner organisations. The balancing of the two survival patterns occurs when ideas generated or refined within HP Labs are taken to an external business unit with responsibility for further investments and assessments of commercial viability. Martin Sadler explains; “If managers have the right to veto when looking at new ideas, then people are gates that can say no and then you kill too many ideas. The idea is to not let internal budgets but market forces decide. If you have ceilings in the wild then one of the ideas will grow above the others and shade it out. If they can persuade the lab-director, then that is one gate. And then it is whether I can persuade the CTOs in other businesses in the company”.

It is clear from the conversations with executives that they see a clear role for both the improvement survival pattern as a means of establishing control, and equally they greatly value the importance of innovation survival pattern as means of creating more radical change. According to Stephen Warrington, “a box-ticking world actually makes it harder to be truly innovative”, which is in line with the notion that the most innovative organisations rely on business model innovation rather than innovating their operations.<sup>14</sup> This relates well to the need to balance vertical command-and-control decision processes with the cultivation of horizontal collaboration.<sup>15</sup> It also is consistent with the old idea that organisations from time to time, in order to progress, must learn how to forget and balance reason with play and experimentation.<sup>16</sup>

In the Financial Times, Nokia's CEO, Olli-Pekka Kallasvuo expresses his challenge as preparing Nokia's 60,000 employees to “spin on a dime if need be”, and that “you need to have years of economies of scale and you need to have flexibility and responsiveness, and then find the right balance between the two”.<sup>17</sup>

Some of the large corporations traditionally dominated by an improvement survival pattern clearly recognise the need to engage more effectively in networking to become more flexible, whereas smaller professional services firms often needs to re-balance through establishing barriers to innovation. There are good reasons in some situations to create barriers to effectively screen out innovations that may be deemed risky or not beneficial.<sup>18</sup>

Extensive centralisation of essential decisions may diminish the organisations' ability to both innovate and listen to emerging customer demands – a survey reports 61% of CIOs arguing that regulation stifles innovation.<sup>19</sup> Too much focus on customer demands, however may result in missed market opportunities for growth. Too much focus on innovation may lead to unacceptable risks and jeopardise the entire organisation as contemporary examples have demonstrated, for example, the extensive dot-com experiment as well as Enron's demise.<sup>20</sup>

Steven Warrington, Diamond Consultants, summarises the challenges in terms of volatility of demand in a very strange environment where; "the macro-economy seems reasonably good but nobody feels comfortable because within this macro-picture, any individual element at any time is subject to volatility, which makes people feel uneasy. So this notion of riding a wave of growth doesn't really feel like that because of all the potential disruption and dislocation in any segment of what people are doing."

Bira Lima, BAT, reflects on the challenging trade-offs; "What we are trying to do with IT is no different from other functions such as brand and supply chain. We try to find the optimal balance between leveraging economies of scale and at the same time being flexible to exploit opportunities that present themselves in the market". Considering the complexities of negotiating the improvement versus innovation survival patterns, it becomes clear that strategic advantage is less a matter of what specific type of generic system the enterprise adopts, but rather the specific context of improvement and innovation it is configured for.

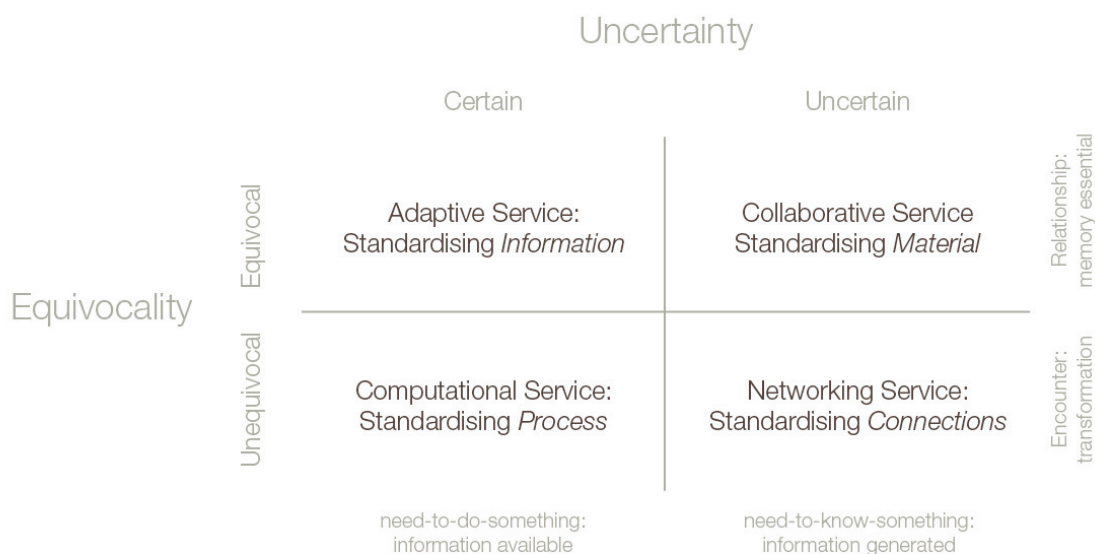
### 3 Understanding information services components

Having identified some of the essential challenges facing executives in terms of managing organisational change, this section proposes a model for thinking about the role of ICT in this context. The relationship between diverse organisational activities and ICT support is formulated in terms of information services. Whilst this presentation is mostly theoretical, Section 4 and 5 will apply the model in a discussion of the strategic role of information services for organisational innovation.

The aim of presenting this model is to make sense of the apparent confusion of the strategic importance of information services for organisational innovation. We believe that much of the discussion so far either has been focused too much on specific applications, or promotes too simplistic an understanding of the relationships between business requirements and ICT capability.<sup>21</sup> Moreover, we believe that the debate either has been divorced from the real challenges in business, or on the other hand has addressed these but with a far too naïve view of the diversity of organisational and technological choice. The model presented here opens the black box and reveal the diversity of ways specific business information needs can be supported by ICT.

The framework characterises information services in two dimensions, to create four distinct information service elements (See Figure 2)<sup>22</sup>.

**Figure 2: Four information service building blocks linking business need with ICT support.**<sup>23</sup>  
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The two dimensions are uncertainty and equivocality:

- **Uncertainty in the information.** The availability of stable and reliable information at a given point can be explained in terms of the degree of uncertainty. A low degree of uncertainty implies that decisions can be made without collecting further information ie a person simply *needs-to-do-something*. Situations with high uncertainty raise questions and demand that information is produced, ie a person *needs-to-know-something*.
- **Equivocality in the consequent decision making.** Some situations are straight-forward to understand and make decisions in, whilst others are equivocal, meaning that even if all necessary information is available there can still be many conflicting interpretations. Unequivocal situations are those where decisions can readily be made on the spot. They are well-structured and analysable and organisations can develop standardised strategies across many situations.

Unequivocal situations can be dealt with through encounters, as they are straightforward and do not require ongoing interaction or service-memory. We engage in encounters when we enter a shop to buy milk and bread. Encounters ensure efficiency, speed, and uniformity of services.

Equivocal situations can, however, only be resolved through engaging in relationships in order to negotiate the consequences of decisions. The relationships help those involved to discover the unique characteristics of a situation. Relationships are characterised by memory and duration and also serve the purpose of establishing trust between participants. Most people have a relationship with their doctor or their solicitor. Some people might also have a relationship with the hairdresser, while others use encounters for that purpose.<sup>24</sup>

Combining these two dimensions of equivocality and uncertainty results in the following four information service elements: computational, adaptive, networking and collaborative services. In the following section we will briefly present each of these four elements.

### 3.1 Computational service

Computational services are standardised and repeatable encounters supporting a person needing-to-do-something in response to an unequivocal and stable situation. The encounter ensures efficient, speedy, and uniform responses. Computational services standardise **processes** in order to provide standardised, repeatable responses across many different situations.

The common standardisation of back-office procedures are good examples of complex information services where the core functions are made up of computational services. The simple act of withdrawing funds from a bank account requires the standardisation of this process. It is an encounter with the purpose of *doing-something*. If it turns out that the task at hand is indeed equivocal then the person using the computational service will experience **structure overload**, which implies that the enforced process does not match the one desired and an adaptive services offering a relationship would be more appropriate.

## 3.2 Networking service

Networking services respond to unequivocal situations where there is a need-to-know-something, and where an encounter generates the necessary information through a standardised **connection**. The emerging information requirements are well-structured and the information is generated through, the use of standardised methods of connecting people with each other and with information sources in an efficient, speedy, and uniform manner. This can for example be through phone calls, emails, telegrams, faxes or Google searches.

Networking services merely standardise connections and can lead to **interaction overload** as they allow instant connections where there may only be limited resources to respond. Bill Gates' reported 8 million emails per day and denial-of-service attacks of web-servers are examples of interaction overload.

## 3.3 Adaptive service

Adaptive services support equivocal situations where there is a need-to-do-something and all the necessary information is available. Here, uniform responses are insufficient and relationships allowing local adaptation are required, in order for competent people with experience and skills to adapt standard responses to the specific context of use. Adaptive services standardise **information** but leave it to the participants through the relationship to negotiate decisions in response to the equivocality of the specific situation.

A cab driver uses an adaptive service throughout the shift to regularly keep the control room updated with the cab's location. The adaptive service standardises the recording of cab's current position according to an agreed classification, which provides sufficient information for the control room to assign the driver good jobs close by. If the adaptive service is not properly designed, it may lead to the user experiencing **information overload**, for example if the computer cab system asks the driver to enter the cab's position each second.

## 3.4 Collaborative service

Collaborative services respond to equivocal and uncertain situations where a relationship enables participants to engage in mutual adjustment and information generation, through collaboration and sharing of knowledge. They standardise the **material** needed for the participants to engage in generating information and negotiating decisions. Co-authoring a PowerPoint presentation through series of collaborative updates of a document shared on a server is an example of a use of a simple collaborative service.

Collaborative services may or may not support collaboration beyond offering a standardisation of the material. Coordination mechanisms help collaborators coordinating their activities by further standardising the process of engaging with the shared material, for example through coordinating the process of joint editing of a document to ensure a change made by one person does not overwrite one made by another.<sup>25</sup> Awareness support standardises and displays the status of the collaboration to provide an overview, for example in a list of who currently are engaged in editing a document and who is editing what section.

**Transaction overload** can occur when a group of people jointly seek to engage in mutual adjustments and collaboration using collaborative services for problems that are beyond the scope of information services. Such problems are simply so uncertain and equivocal that meetings, walls covered with diagrams, physical models, or other types of support is needed. The group may discover that distance matters!<sup>26</sup> This point can be emphasised by considering the difference between collaborating to jointly author a 1000 word document on a predefined topic and a group of people seeking to collaboratively author a complex novel. Writing the novel may require meetings to discuss the plot and characters and attempting to go ahead anyway can lead to an infinite set of rewrites and much frustration as the purpose and direction of the plot is evolving.

**Figure 3: Summarising the four elementary types of information services in terms of characteristics, examples and type of possible misfit. ©Mathiassen & Sørensen 2007**

Service	Description	Standardise	Examples	Misfit
<b>Computational</b>	Standardised and repeatable encounters supporting a person needing-to-do-something in response to an unequivocal and stable situation	Processes standardised leading to repeatable responses across many different situations	Automation of back-office procedure in simple routine	Structure overload if the process streamlined is more complex, creating need for adaptive behaviour
<b>Networking</b>	Emerging encounters responding to unequivocal situations where there is a need-to-know-something	Connections standardised between people and with information sources	Mobile phone call, email, or Google search	Interaction overload when recipient of connections gets unwanted or too many requests
<b>Adaptive</b>	Standardised relationships supporting a person needing-to-do-something responding to an equivocal situation	Information standardised leaving participants to negotiate decisions in response to the requirements of the specific situation	Cab driver keeping a central control room updated with the cab's location	Information overload if service constantly asks for updates
<b>Collaborative</b>	Emerging relationships supporting mutual adjustment between people responding to equivocal and uncertain situations	Material standardised allowing participants in generating information and negotiating decisions	Collaborative platform allowing several people to co-author a document	Transaction overload if the problem is too complex for information services and requires extensive physical interaction

## 4 Making ICT matter in innovation

One of the consistent findings across most of the executives we spoke with for this project was their strong devotion to understanding business concerns and ICT support not as two separate worlds, but rather as intimately intertwined and inseparable.

Bira Lima, Head of the Strategic Business System Group at BAT, argues; “I have a huge problem with the ‘Business and IT Technology’ distinction. I don’t believe in it. I feel that IT is part of the business so when you start to describe automation and IT in the business you are creating a divide. A big part of our challenge is to drive the organisation to think of IT as part of the organisation”. This view is also supported by other studies of executives where successful innovation is linked to the organisational ability to conceptualise business and ICT innovation as a whole.<sup>27</sup>

Bringing ICT close to the business can be a quite subtle art. For example, adaptive services represent relationship value as they reflect the organisation’s accumulated ability to understand the informational requirements of its surroundings and how to best engage through standardised information. Paul Brindley, Cadbury-Schweppes, explains that the company uses significant resources on profiling customers, and generally considers this accumulated and continuously changing knowledge as highly proprietary. He outlines a two-tier structure with basic systems and services being outsourced whilst the strategic issue of consumer profiling had been insourced from marketing companies to support critical understanding of consumer behaviour through bespoke classification against proprietary data.

The team at Cadbury Schweppes were also aware of the strategic importance of close management of logistics systems. Not so much because these are bespoke systems, but their configuration is. If the piece of chocolate the customer wishes to buy is not in front of them, they will most likely choose another one and the risk is that they then will adopt this as their favourite. Together these two systems helped the company get much closer to their consumers both in terms of understanding them through analysing their behaviour and in terms of products reaching them effectively through logistics systems.

Here we have an essential point about the role of ICT in delivering differentiation, namely the distinction between systems with an inwards purpose of supporting effective running of the organisation, and systems that also serve as direct or indirect links bringing the organisation more in touch with its customers or partners. Subsequently we will see that there is a great variety in understanding how information services can “touch customers”, and therefore more ways of understanding the value of organisational innovation with information services than that of simply standardising and automating transactions.

## 4.1 From encounters to relationships – bringing data into the equation

The analysis of ICT in organisations that presents it as a collection of static systems with specific and easily identifiable uses only holds for quite simple uses of ICT. Re-framing the problem in terms of information services automatically allows a more complex understanding of the relationships between the organisation, its customers, and the ICT capabilities presented through combining information services into portfolios.

For example consider Second Life, a complex portfolio of information services allowing users to assume the form of avatars in a 3D world where they can engage with others, occupy land, and construct buildings.<sup>28</sup> Understanding this simply as the execution of a long series of computer code instructions, which it of course will look like to the computer running the application, will entirely miss the essential aspects of the information services in front of us. If we view Second Life as a collaborative service where a large group of people (3 million residents in January 2007) engage in ongoing mutual adjustments through standardising the material on which they interact – the 3D world and its associated built-in rules of interaction – then we suddenly understand more of the essence. It is an eternal interactive conversation where the value for both users and company is more related to the millions of people signing up and offering their added objects and traces of behaviour, than it is the initial algorithmic patterns of code created by Linden Lab.

In the same manner, the selling price of Hotmail of \$400 million to Microsoft, or Google's acquisition of YouTube with 67 employees for \$1.8 billion was less about the actual underlying code of the two systems – that easily could be replicated by a bunch of top-programmers. It is a direct reflection of the value of a highly sophisticated collaborative platform with a large global user-community.

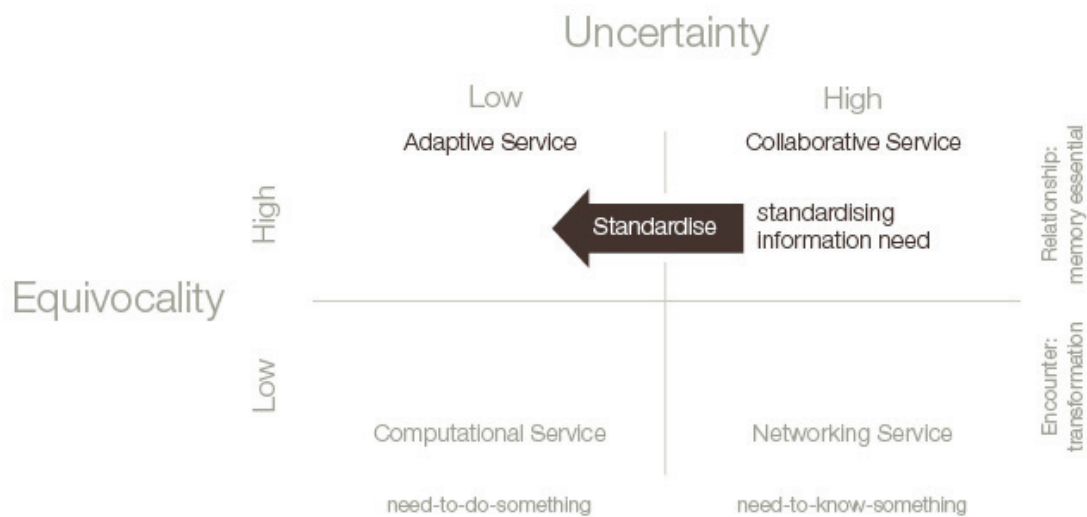
## 4.2 Taming reality and streamlining decisions

The traditional role of ICT in organisations has been to help the business become more efficient through standardising and speeding up decisions. These two steps can be explained in terms of the four information services elements in two steps illustrated in Figure 3 and 4.

In the process of understanding how ICT can support decisions, one of the first approaches has traditionally been to “tame reality” by identifying decisions, which despite being conducted through complex collaborative processes of mutual adjustments, can in fact be standardised (See Figure 4). Although it represents the initial challenge “getting the basics right is extremely difficult and takes creativity” argues John Connolly, RMT Thames Water.



**Figure 4: Selecting specific decision processes and applying standardisation increases efficiency through removing variation. This is typically supported by forms and other formalisations of information. ©Sørensen 2007**

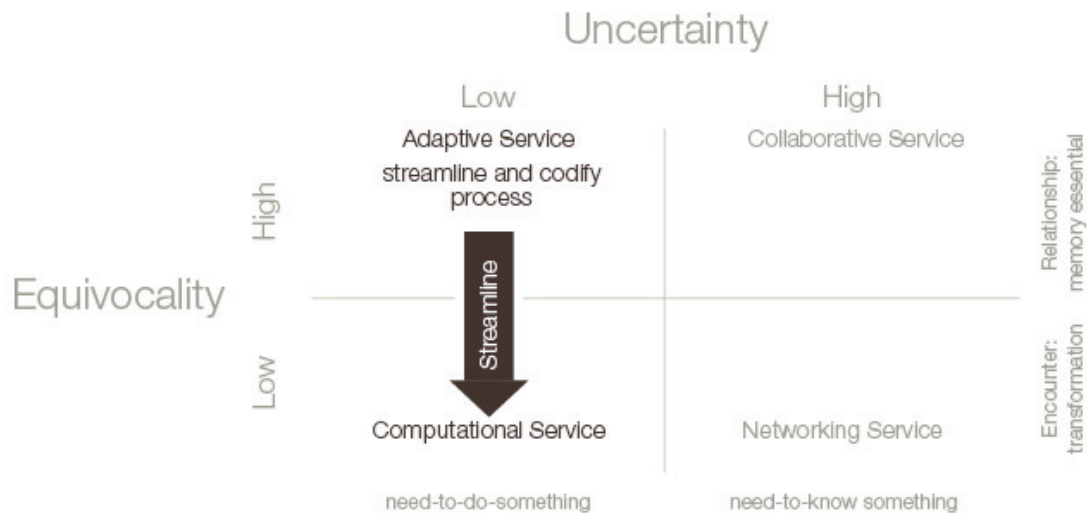


Although the transition from a collaborative service to an adaptive service requires the standardisation of information, the new decision process still essentially remains a relationship and thus requires the engagement of participants to agree exactly how the information will be used.

Furthermore, some of the decisions that have used forms or similar data structures to standardise information will then be considered ready for further efficiency gains through streamlining. This involves embedding the decision in a computational service automating it through algorithmic codification (See Figure 5) – essentially removing discretion and creating an highly repeatable automated process. Establishing the automation of back-office procedures is a direct result of this kind of process, and it is these kinds of processes that most lend themselves to outsourcing. It might also be argued that it is these kinds of scalable and repeatable computational processes that are considered the kind of 'utility IT' that Nicholas Carr argues do not matter.

John Murphy, Marks and Spencer, argues for the efficiency of using ICT as a means of supporting growth; "There is shaving costs of your past and shaving costs of your future. As we expand either range of products or number of stores the complexity for allocating things grows quite substantially. So you can either support that through technology, and get real economies of scale, or you can support it by linearly increase headcounts and continue working the way you do."

**Figure 5: From the pool of standardised decisions some may be amenable for streamlining through embedding decisions in computational algorithms further reducing the need for human discretion and thus effectivising the decisions. ©Sørensen 2007**



Streamlining decisions and codifying them in algorithms can be done either with those decisions that are unequivocal, or in a similar manner to standardising decisions, simply **deciding** that they are unequivocal.

The two-stage strategy of standardisation and streamlining, although essential and useful, also essentially forces through a logic where the efficiency of the encounter will limit the role of ICT as an enabler of business innovation. The main problem is simply that there is a limit to how much innovation can be driven by simply turning relationships into automated encounters.<sup>29</sup> Furthermore, such innovation tends to be based on a rather inwards-looking view, emphasising optimisation of internal operations, as opposed to a more comprehensive understanding of how to meet external needs and in particular the wishes and desires of customers.

Whereas the process of streamlining business operations traditionally has been dealt with through implementing large-scale solutions from single vendors, new approaches emphasise a best-of-breed approach. According to Paul Brindley, Cadbury-Schweppes, the monolithic approach easily leads to loss of agility. Andrew Barnes, United Utilities, argues, “the whole strategy of how you de-risk has changed. You used to de-risk by single-badging, for example buying everything from IBM. Now you de-risk by compatible components through open standards.”

An example of how information services create direct contact between the organisation and its customers illustrates this well. The past decade's emergence of call-centres has allowed customers increased direct access to organisations even outside normal opening hours. However, it has also led to the introduction of a number of services aimed at streamlining the processing of customer requests, for example by having customers engage in pre-selection of services on their phone key-pad, and by subsequently playing a standard message instead of connecting to a customer services representative. Eventually the aim is to channelling as many requests as possible from call-centres to websites where no direct human interaction is required.

Standardisation and streamlining can not only lead to reduced costs but also provide a platform for service innovation as was illustrated by several of the executives we interviewed and by research.<sup>30</sup> Murray Bain, the CIO of NHS Direct, illustrate this in terms of their project of: "moving the organisation from 22 separate technology solutions to a single solution. So we have now got a national application with a national database containing around 10% of the population with any of those patient records available from anywhere in the UK". Through centralising and standardising their systems, NHS Direct has been able to offer service innovation through customers and call-centre staff accessing one central record for each unique caller.<sup>31</sup> The centralised system is a platform for innovation, for example in terms of balancing the load on call-centres across the country or allowing access to any patient record from any location in the UK.

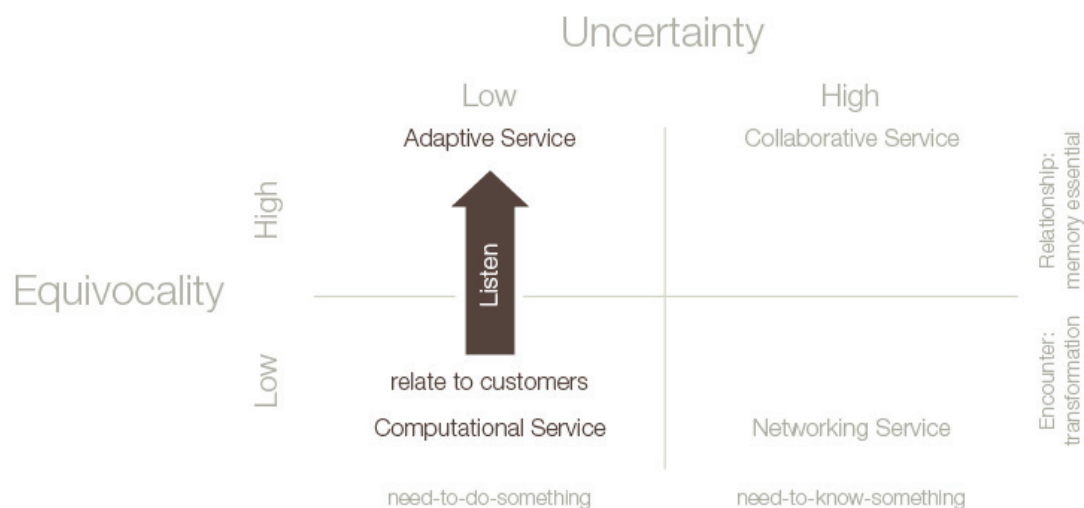
The extent to which it is feasible to standardise and streamline business processes through information services depends on the nature of the business. Norton Rose's IT Director, Jeff Roberts, draws a comparison between the retail sector and professional services firms; "Retail is relatively easy, which means that a strong relationship between the business and the IT function can be forged. Professional services is much more difficult, and it is generally a challenge to tightly couple business concerns and IT concerns." He further argues that in professional services firms understanding work in terms of business processes can be difficult as the professionals do not necessarily recognise the possibility of externalising business process but rather view these as an integral part of the right to professional discretion. From Marks and Spencer John Murphy, Head of Business Solutions and Programmes, and Alan French, Head of Strategy and Architecture both agree that alignment between business and ICT may be easier than in other sectors. However, they also argue that it is very difficult to gain a competitive advantage from this alignment.

### 4.3 Computation or adaptation?

There is an emerging shift in the demands of customers from not only wishing to engage in encounter-based consumption of affordable mass-produced goods and services, but to engage in ongoing relationships with organisations in order to obtain personalised support.<sup>32</sup> Information service innovation can support the creation of meaningful relationships with customers if mutually beneficial relationships can be mediated through the services (See Figure 6). The aim of this is to bring the organisation closer to its customers and partners through supporting listening to them and adapting services to their individual or group preferences.

Matt Fahy, Aviva, illustrates the changes driving the need for engaging in a more adaptive relationship with their customers; “As an insurance company 20 years ago we did not think much about customers. It was a very paternal view of customers. Whereas now, our number one strategic priority is our relationships with customers across the globe, how we understand them and interact with them. How we develop our business to fulfil their needs. We solve this by very much operating in a devolved manner. Insurance by and large is local products for local markets. So we don’t have a single product or one single service we can repeat from country to country. But the actual IT approaches, the standards, the designs and possibly- but maybe less so – even the solutions can be shared.”

**Figure 6: Adaptive services innovation engages the organisation in more complex relationships and meets complex customer demands through the enterprise increasingly listening to the customers and adapting behaviour to what it hears. ©Sørensen 2007**



Matt Fahy, Aviva, argues that traditionally the way their business has operated has discouraged them from engaging in deep relationships with customers; “In particular when a lot of our businesses consisted of long-term saving, products were imagined and created and priced 10 or 15 years ago when consumers wanted to behave differently and we didn’t price into that building a relationship with them on a one-to-one basis. You got your product and hopefully at some point at the end it paid up, or you died, or something happened and that was sort of the level of relationship.”

He points at developing more substantial relationships with customers as a big challenge and mentions Aviva's Pay-As-You-Drive as a good example where a GPS device mounted in the car allowing for the premium to be calculated based on driver behaviour, "which really changes the product and it changes the relationship with the consumer. We have taken the concept initially implemented in the UK and we have versions of that in our Irish and Canadian businesses where we both places have partnered with the Government and launched the project on the basis of creating safer young drivers. And the technology itself is innovative, but the kind of relationship you create with the customer is innovative as well."<sup>33</sup>

Paul Myerscough, Honda Motor Europe also argues for the need to engage in some strong relationships with customers through technology; "We have around 7000 dealers. The Holy Grail for us is to find out what the customers want and the dealers manage all our relationships with customers. So if we have effective systems which they can use, which are sensitive to customer contacts, then that would be wonderful."

Impaq's Supplier Portal allowing customers to link directly into supplier systems through a web-based interface provides another example of how ICT can facilitate stronger relationships.

Mushtaque Ahmed, JJ Foods, explains how the company has innovated its interaction with customers through adaptive information services. At JJ Foods, 700 employees work towards supplying fast food ingredients, soft-drinks, and a range of other products to a customer-base of more than 20.000 small restaurants and fast-food outlets throughout the UK. Many of these are owned and run by people who prefer to speak with call-centre representatives in their own native language as opposed to English.

The company conducts an initial profiling of customers and uses this data to serve the individual customers better each time they call to order goods. The telephone system will match the caller's number to their profile and for example play music from their ethnic background while they wait for a call-centre assistant. For customers who have indicated that they prefer to speak in their own language, the call-allocation algorithm will direct their call to an appropriate assistant. In case none is available, the call will be set to wait slightly longer before it passes the customer on to an English speaking assistant, who immediately will apologise and offer to have another assistant call back when available. This is a good example of how an adaptive service where the caller's explicit preferences are remembered and used to enact specific behaviour of the system comprised of ICT and call-centre worker. The system at JJ Foods quite literally listens to the customers preferences.

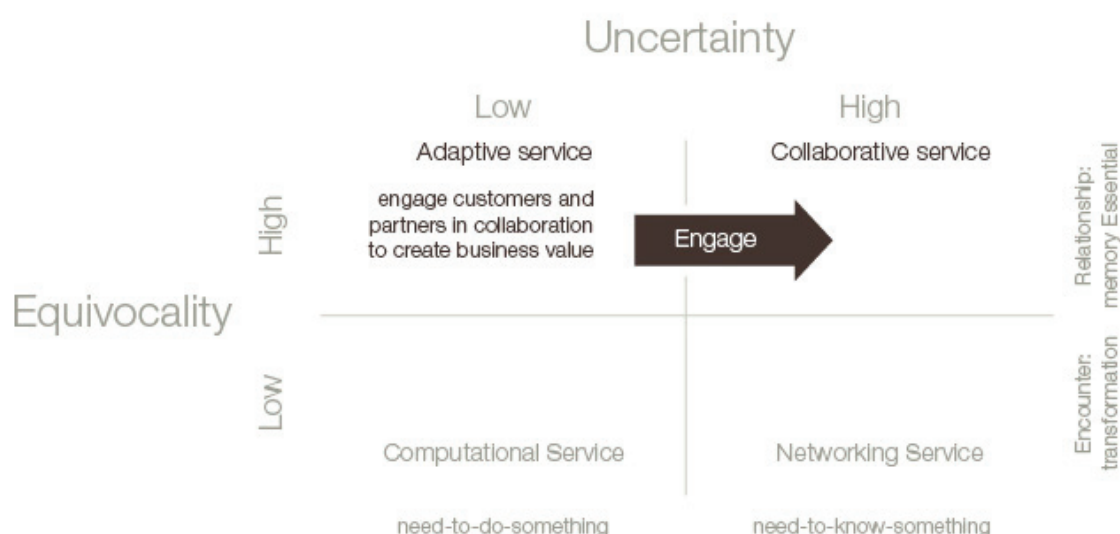
Listening to customers and partners through innovative information services can not only produce better bottom-line results, it can also play a more fundamental role in the reshaping of business. Several of the executives discuss how their business increasingly involves changing from engaging with customers and partners through relationships as opposed to encounters. At Aviva, Matt Fahy reports that they are actively developing products taking this into consideration. At Ovum, relationships with high-value clients has replaced an encounter-based business model. Murray Bain from NHS Direct explains how the UK's National Health Service seeks to engage with citizens in an ongoing relationship supporting well-being, as opposed to only offering encounters usually initiated when the citizen falls ill. Daniel Kasmir, Manpower, illustrates his company's changing business models in terms of increased closer relationships where the company does not only help in recruitment but manages the whole process on an ongoing basis.

Reversing the trend of looking at innovation with information services exclusively in terms of driving efficiency and cost reduction is difficult but essential, as the alternative is to only compete on efficient encounters, which ultimately will not meet evolving customer needs, or through relationships almost exclusively mediated through human interaction, which is very expensive. The role of adaptive information services is to help organisations to listen to customers.

## 4.4 Collaboration across boundaries

Why stop once the organisation is able to listen to customers through adaptive information services? The next level is to actively **engage** customers through deploying collaborative information services. Collaborative information services support mutual adjustment across the organisational boundary by providing an infrastructure for information-service mediated collaboration. These services can be used as enablers of further 'open innovation' where collaboration with customers, partners and even competitors interactively shaping services and content. This involves using collaborative information services as means to engage customers and partners in collective creation of valuable support (See Figure 7).

**Figure 7: ICT enabled innovation engages through collaborative platforms the organisation, partners and customers in mutual adaptation and value creation. ©Sørensen 2007**



Collaborative services enable ongoing relationships of mutual adjustment through sharing of material. It essentially involves the customer directly in defining, shaping and delivering aspects of the service. Andy Frith, BAT, argues; “involving the consumer in the innovation process does de-risk it quite a lot” and continues that this will give valuable feedback as to the relevance of the innovation.

Jonathan Smart, Deutsche Bank, mentions an example where the bank has; “gone live with a blog between one of our trading desks and our external clients – and they love it. So the Head of Desk is putting articles on the blog each day.” This example emphasises a possible role of blogs as one of the ways in which enterprises and professional individuals can engage in ongoing rich conversations with customers through a collaborative service.<sup>34</sup>

Tight collaboration is becoming important even for professionals, who traditionally have enjoyed extensive autonomy. Jeff Roberts, Norton Rose, foresees a near future where large clients of their legal services will want to take the client-professional relationship further and support it through direct client access to Instant Messaging, an innovation used for some years amongst traders and their large clients.<sup>35</sup> The role of presence-servers and automatically updated information on presence will become an essential aspect of work in professional services organisations.

More generally, the shareware software company is an example which represents the use of collaborative information services to engage in complex relationships with customers, and we are already seeing several examples of how this can create interesting new businesses. YouTube is essentially a collaborative platform for users to engage in the sharing of videos. Flickr is a platform for sharing of images and integrating these into other applications. eBay offered a shared platform for customers to collaborate around the specific activity of buying and selling in auctions and was one of the significant survivors of the dot-com crash making money throughout.

The so-called Web 2.0 movement is one of establishing advanced collaborative services on the Internet based on utilising the existing infrastructure elements as building blocks. The Application Program Interfaces (APIs) defined by Amazon, Google and eBay established standard elements enabling the meshing of different information services, allowing for the creation of new ‘Software Mash Ups’.

Thinking in data as opposed to systems as strategic resources can explain some of the recent developments as enterprises establish global collaborative infrastructures which their customers can take and work with to make their own. As explained by Bill Watkins, CEO of Seagate: “YouTube is like eBay. The founders didn’t know what they were doing. The consumers just took hold of it.”<sup>36</sup>

## 4.5 Networking support essential

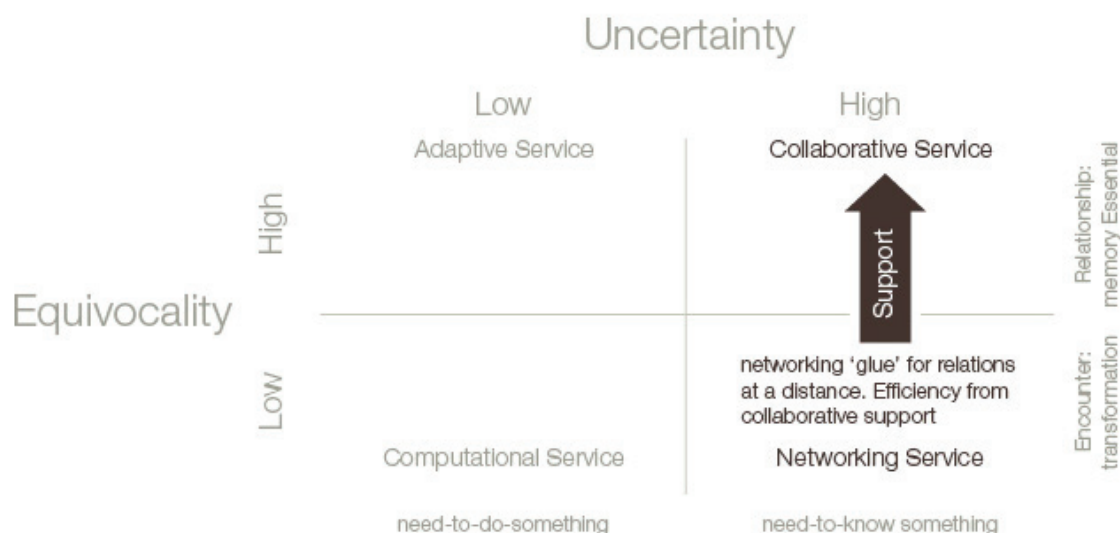
With the dynamics between information services innovation between the computational, adaptive and collaborative services mapped out, the question remains as to the role of networking services for innovation. After all they have exploded in use ever since the telegraph was invented, with the modern Internet allowing for rapid electronic contact between places around the Globe and access to a wealth of information sources. Since then, technologies such as the telephone, remote database access, the fax machine, email, mobile phones, SMS messaging, Internet searches, and instant messaging have helped in realising a myriad of networking services allowing instant touch.



Networking services provide flexible access to information and people and therefore allow easy coordination of activities across boundaries. Whereas the extensive standardisation and automation of decisions has enabled efficiency gains, it remains problematic when the standardised and streamlined decisions occasionally meet resistance from exceptions to the rules and procedures. In these instances, direct intervention of, interaction between and discretion from individuals is essential, and networking services can be seen as the 'glue' enabling the negotiation of such exceptions (See Figure 8). More generally, it can be argued that networking services with their simple standardisation of connections have contributed to the destruction of rigid decision making in large hierarchical organisations in a creative manner without fundamentally changing the structures.<sup>37</sup>

The role of flexible networking and of networking services is in particular important amongst knowledge workers.<sup>38</sup> This is clear from our conversations with executives from HP Labs, Norton Rose, Steljes Markets, and Diamond Consulting. The emphasis in these cases is often to support knowledge workers collaborating with colleagues and clients through various kinds of networking services rather than on rendering decisions more efficient by embedding them in information services.

**Figure 8: Networking services offers 'glue' for handling disruptions to standardised and streamlined decisions but increased complexity will call for support through collaborative platforms.**  
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Chris Dines, former CEO Ovum, argues that the changes in their business model implies; "Large-value relationships. Lots of very high touch relationships at very senior level. And the average age has gone from nearly 24 to 40 the last five to six years because we cannot afford to have people even young graduates sitting here desktop researching. We outsource. We do not have any telesales. It is all relationships, face-to-face selling." Such a change clearly must be underpinned by changes to the systems supporting the business. At Ovum, the change has placed great demand on highly sophisticated use of email offering a highly flexible means of networking.



Collaborative services must be designed carefully, and depending on the nature of the business activities they need to support, the collaboration elements more or less formally. In knowledge intensive work settings the business processes can either be missing, vaguely defined or outright rejected by the participants. There is a span of possibilities for support from simply collaborating through a shared file-server or by forwarding email attachments between collaborators to using fully-fledged collaborative platforms. As Bira Lima, BAT, argues: “The most effective communication tools we currently have are the telephone, email and using the shared file system we’ve set up”.

The extensive use of networking services as the primary means of collaborating may, however, not be optimal. Email in-boxes stuffed to the brim with large attachments from a range of collaborators is an escalating problem and individuals may feel that they are drowning in interaction from multiple sources. Here, one possible innovation with information services can be to seek explicit support for ongoing collaborative relationships through a collaborative service as opposed to through networking services only supporting a series of encounters (See Figure 8). SharePoint servers, Lotus Notes workflows, Wikis and other measures based on collaborative services can facilitate more fluid collaboration as they will contain specific support for engaging in collaborative relationships.

## 5 Stages of innovation with information services

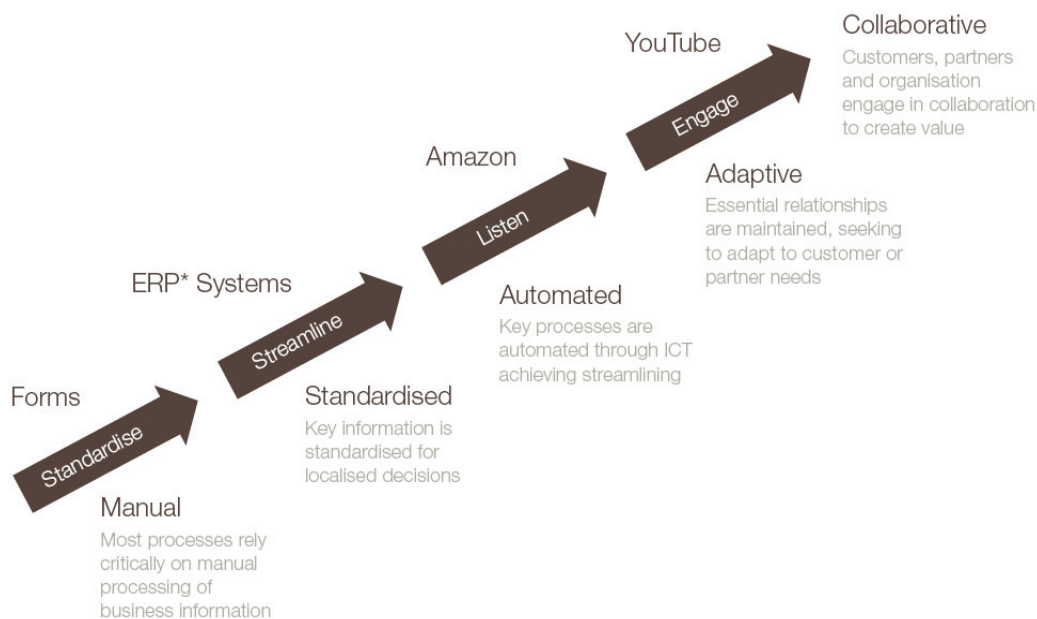
We have explained the range of possible roles for ICT in innovation in a business:

- establishing the standardised and automated business through processes of standardising and streamlining (primarily aimed at improving internal efficiency).
- adding listening through adaptive services, involving the application of innovative information services to reach out to customers and partners.
- finally reaching out and engaging customers and partners directly in the formulation and delivery of services requiring support from collaborative services.

This range of ICT applications extends the possible role of ICT, in the context of increasingly dynamic and chaotic businesses, facing the conflicting pressures of strategy and operational performance, centralisation and decentralisation and continuous improvement and innovation

This section synthesises these findings in a 5-stage model providing the executive with a more ordered way of understanding where information services can support innovation and add value (See Figure 9).

**Figure 9: Organisational innovation with ICT can be characterised in the five stages of manual-, standardised-, automated, adaptive- and collaborative business. ©Sørensen 2007**



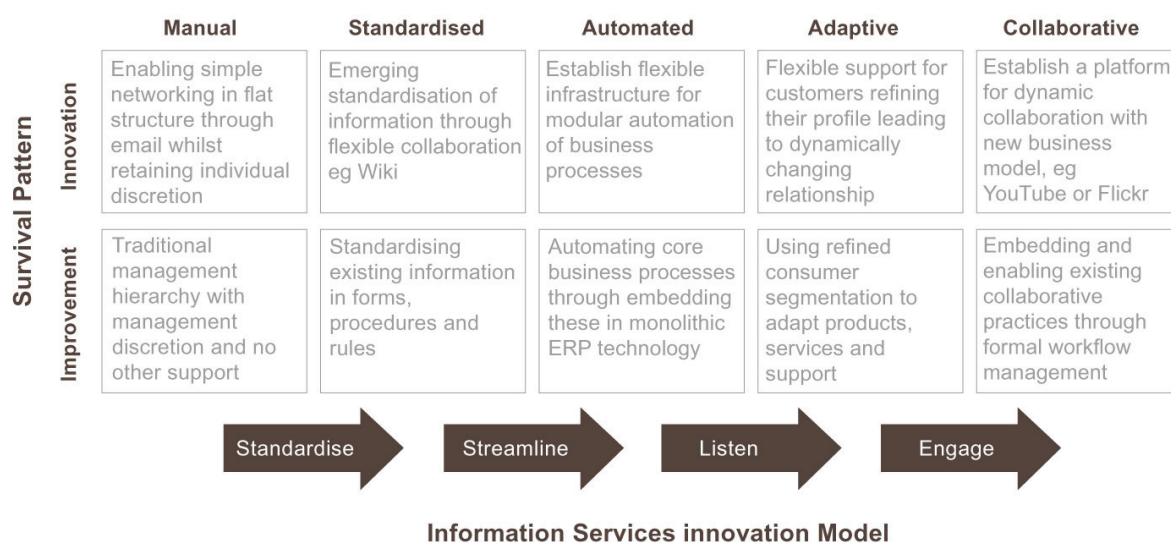
This is an analytical model characterising ideal situations and organisations can in practice have various aspects of their operations at different stages. As Jonathan Smart, Deutsche Bank, argues, he sought to innovate the business in general based on experiences with advanced innovations at the trading desks.

However, the model can provide useful pointers for “Where Next?” with investment in ICT. For example, retail organisations that have established automated operations may be thinking about how to recreate a listening relationship, using Adaptive ICT services. Organisations with a strongly adaptive service may be looking at how to create collaborative services, where the voice of the customer influences the products. And where the service is strongly collaborative, there may once again be pressure to find ways in which ICT can standardise and streamline the service for efficiency.

Alan French, Marks and Spencer, argues that whereas in general ICT strategy is a business-led ICT plan, this does not consider that: “If you align your IT strategy very tightly to your business strategy and you take the line people like Nicholas Carr espouse, you tend to end up with very short lead times to deliver relatively complicated technology platforms. The case for “IT Doesn't Matter” tends to fade a little bit when you look at the big bets. Actually when you start to look at the smaller bets it is the right thing to do. If you get your big bets right you can focus on what the business wants to do”.

Most organisations are forced to simultaneously juggle a range of small and big bets concerning a complex mix of business and ICT challenges. Figure 10 illustrates how to consider the trade-offs between an improvement and an innovation survival pattern for each of the stages of information services maturity. This table provides a framework for strategically mapping the improvement and innovation efforts of the organisation in relation to information services. We have populated the table with examples for illustration only.

**Figure 10: Contingency model characterising alignment of survival pattern and stage of ICT innovation.**  
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One thing is sure; the potential for gaining value from ICT has hardly been tapped, so long as the executive can see the possibilities.

## 6 Take-aways for the executive

ICT has, for decades, ranged from black art to technical taboo in the boardroom. Forward-thinking executives will recognise that the information age is only just beginning. Standardising and streamlining processes and supporting them with computational services has been just the first step.

Standardising and streamlining remain critical if not strategic and for some organisations, outsourcing of highly standardised and commoditised services makes a good deal of sense. What remain as strategic considerations, however, are the more complex applications of ICT to create adaptive and collaborative services.

The new way of thinking about ICT presented in this report exposes a far greater potential for the strategic use of IT to innovate. The debate between “is it or is it not strategic?” has been replaced with a more meaningful analysis. The implications for the executive, and especially the CIO, are profound:

### **4. Customers demand services with high relationship value**

Customers, whether as consumers or business, have got used to sophisticated collaborative information services as a natural way of working. The current explosion in blogs, trading communities such as eBay and virtual worlds such as Second Life highlight the appetite for richer, ICT-enabled interactions and a blurring of traditional boundaries.

### **5. Just automating will stifle innovation and eventually kill your business**

Innovating with ICT can often be stifled by automating, streamlining and enforcing process control as the only way of thinking. On its own, this approach could kill your business as customers leap forward in their expectations of the way they wish to interact with you. The key is to never regard any aspect of the end-to-end customer process as finished.

### **6. Forward-thinking organisations are seeing IT as the basis for a step change in what is possible in the customer relationship**

Many organisations have woken up to what customers are demanding but have yet to modify their approach to investing in and managing value from ICT. Forward-thinking companies are seeing ICT not just as a means of automating and reducing costs, but also as the basis for a step change in what is possible in the customer relationship, with an emphasis on interaction rather than automation.

### **7. The ‘inside-out’ organisation will develop strong relationships with customers that help shape future strategy**

By using IT to bring customers and staff together, businesses can move from providing products and services to providing experiences and ultimately developing relationships. This new ‘inside-out’ organisation could create interactions and relationships with customers that actually shape strategy rather than are subject to it. In doing so, senior executives must take a more collaborative role, acting as a catalyst for innovation wherever it may evolve.

As astutely observed by Deutsche Bank's Jon Smart: "Technology is only a utility when you stop innovating, and obviously we're not going to stop."

# Appendix A: Endnotes

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<sup>1</sup> <http://www.computingawards.net>

<sup>2</sup> Nicholas G. Carr (2003): IT Doesn't Matter. Harvard Business Review. no:May; Nicholas G. Carr (2004): Does IT Matter? Information Technology and the Corrosion of Competitive Advantage. Harvard Business School Press. no:May

<sup>3</sup> Rajen Madan, Carsten Sørensen, and Susan Scott (2003): Strategy Sort Of Died Around April Last Year For A Lot Of Us: CIO perceptions on ICT Value and Strategy in the UK Financial Sector. ECIS 2003. Naples, Italy. <http://is.lse.ac.uk/wp/pdf/WP123.PDF>

<sup>4</sup> Not only are executives pressured externally from the environment and from their customers, internally from employees, they are increasingly put under pressure to change from gurus and opinion makers. Carucci's book "Leadership Divided" explores the challenges of traditional leadership in a modern world. Ron Carucci (2006): Leadership Divided: What Emerging Leaders Need and What You Might Be Missing. Jossey Bass Wiley.

<sup>5</sup> An IBM study concludes that organisations performing the best are those who are good at business model innovation as opposed to innovating products, services, markets and operations. IBM Global Business Services (2006): Expanding the Innovation Horizon – The Global CEO Study 2006 [http://www.ibm.com/innovation/us/pointofview/enterprise/mar27/ceo\\_study.html](http://www.ibm.com/innovation/us/pointofview/enterprise/mar27/ceo_study.html)

<sup>6</sup> Zuboff and Maxmin explores this subject extensively in their book and paint a problematic picture of the inability of traditional organisations to deliver meaningful support. Shoshana Zuboff and James Maxmin (2002): The Support Economy: Why Corporations are Failing Individuals and the Next Episode of Capitalism. London. Penguin.

<sup>7</sup> Accenture (2006): The Innovator's Advantage. London. [http://www.accenture.com/global/research\\_and\\_insights/policy\\_and\\_corporate\\_affairs/ceoandcioviews.htm](http://www.accenture.com/global/research_and_insights/policy_and_corporate_affairs/ceoandcioviews.htm), p. 9

<sup>8</sup> Thomas W. Malone (2004): The Future of Work: How the New Order of Business Will Shape Your Organization, Your Management Style, and Your Life. pp:304 Harvard Business School Press.

<sup>9</sup> Julian Birkinshaw (2006): Innovation and corporate entrepreneurship: Applying the lessons from clients to consultancies – Presentation July 25th for Management Consultancies Association

<sup>10</sup> Gerald M. Weinberg (1987): Becoming a Technical Leader: An Organic Problem-solving Approach Dorset House Publishing Co.; Lena Gerald M. Weinberg (1987): Becoming a Technical Leader: An Organic Problem-solving Approach Dorset House Publishing Co.; Lena Holmberg and Lars Mathiassen (2001): Survival Patterns in Fast-Moving Software Organizations. IEEE Software. vol:18. no:6. pp:51-55

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- <sup>11</sup> Lena Holmberg and Lars Mathiassen (2001): Survival Patterns in Fast-Moving Software Organizations. *IEEE Software*. vol:18. no:6. pp:51-55
- <sup>12</sup> Julian Birkinshaw and Cristina Gibson (2004): Building Ambidexterity Into an Organization. *Sloan Management Review*. vol:45. no:4. pp:47-55; Cristina Gibson and Julian Birkinshaw (2004): The Antecedents, Consequences, and Mediating Role of Organizational Ambidexterity *Academy of Management Journal*. vol:47. no:2. pp:209-226; Julian Birkinshaw (2006): Innovation and corporate entrepreneurship: Applying the lessons from clients to consultancies – Presentation July 25th for Management Consultancies Association
- <sup>13</sup> Interactive innovation is a way of explaining decreases in distance and increases in interactivity between various stakeholders each contributing to defining and realising the innovation. As an example, where customers traditionally did not have direct influence on the design of services, there is now a need for greater sensitivity to this. Rothwell calls this fifth generation innovation. Fontana & Sørensen explores interactive innovation of mobile services in Brazil involving service developer and mobile service provider. Haddon discusses the role of consumers engaging in every-day innovation and von Hippel explores the democratisation of innovation for example through open source development in a book he then appropriately gives away as a free download. R. Rothwell (1994): Towards the fifth generation innovation process. *International Marketing Review*. vol:11. pp:7-31; Eduardo Ribas Fontana and Carsten Sørensen (2005): From Idea to Blah! Understanding Mobile Services Development as Interactive Innovation. *Journal of Information Systems and Technology Management*. vol:2. no:2. Sao Paulo, Brasil. <http://www.tecsi.fea.usp.br/Revistatecsi/default.asp>; Eric von Hippel (2005): *Democratizing Innovation*. Cambridge, Massachusetts. The MIT Press. <http://web.mit.edu/evhippel/www/democ.htm>; Leslie Haddon, E. Mante, B. Sapio, K.-H. Kommonen, L. Fortunati, and A. Kant (2006): *Everyday Innovators: Researching the role of users in shaping ICTs*. Computer Supported Cooperative Work. London. Springer.
- <sup>14</sup> Accenture (2006): *The Innovator's Advantage*. London. [http://www.accenture.com/global/research\\_and\\_insights/policy\\_and\\_corporate\\_affairs/ceoandcioviews.htm](http://www.accenture.com/global/research_and_insights/policy_and_corporate_affairs/ceoandcioviews.htm); IBM Global Business Services (2006): *Expanding the Innovation Horizon – The Global CEO Study 2006* [http://www.ibm.com/innovation/us/pointofview/enterprise/mar27/ceo\\_study.html](http://www.ibm.com/innovation/us/pointofview/enterprise/mar27/ceo_study.html)
- <sup>15</sup> Thomas W. Malone (2004): *The Future of Work: How the New Order of Business Will Shape Your Organization, Your Management Style, and Your Life*. pp:304 Harvard Business School Press.
- <sup>16</sup> James G. March (1976): *The Technology of Foolishness. Ambiguity and Choice in Organizations*. Oslo, Norway. Universitetsforlaget.
- <sup>17</sup> David Ibison (2006): Nokia's Discrete but Potent Influence. *Financial Times*, December 3
- <sup>18</sup> Richard Baskerville and Jan Pries-Heje (1998): *Information Technology Diffusion: Building Positive Barriers*. *European Journal of Information Systems*. pp:17-28
- <sup>19</sup> Ian Davis and Elizabeth Stephenson (2006): *Ten Trends to Watch in 2006*. *The McKinsey Quarterly*

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<sup>20</sup> Bruce Sterling juxtapose two skunk works projects – one at Lockheed resulting in the U-2 spyplane and one at Enron leading to the 2001 electricity crisis in California. Bruce Sterling (2003): Silent But Deadly Skunk Works Quietly Created Killer Tech. And Paved the Way for Enron. Wired. vol:11. no:3<http://www.wired.com/wired/archive/11.03/view.html?pg=4>

<sup>21</sup> Much of the debate has been concerned with the distinction between bespoke applications and generic infrastructure as well as promoting rather simple generic assumptions of ICT capability as essentially the recording, storage and delivery of data.

<sup>22</sup> Based on Lars Mathiassen and Carsten Sørensen (2007): A Theory of Organizational Information Services. Report Number 162. Department of Management, Information Systems and Innovation Group, London School of Economics.

<sup>23</sup> Based on Lars Mathiassen and Carsten Sørensen (2007): A Theory of Organizational Information Services. Report Number 162. Department of Management, Information Systems and Innovation Group, London School of Economics.

<sup>24</sup> Lars Mathiassen and Carsten Sørensen (2007): A Theory of Organizational Information Services. Report Number 162. Department of Management, Information Systems and Innovation Group, London School of Economics.

<sup>25</sup> Peter Carstensen and Carsten Sørensen (1996): From the Social to the Systematic: Mechanisms Supporting Coordination in Design. Journal of Computer Supported Cooperative Work. vol:5. no:4, December. pp:387-413; Kjeld Schmidt and Carla Simone (1996): Coordination mechanisms: An approach to CSCW systems design. Computer Supported Cooperative Work: An International Journal. vol:5. no:2-3. pp:155-200

<sup>26</sup> Gary M. Olson and Judith S. Olson (2000): Distance Matters. Human-Computer Interaction. vol:15. pp:139-178

<sup>27</sup> Rajen Madan, Carsten Sørensen, and Susan Scott (2003): Strategy Sort Of Died Around April Last Year For A Lot Of Us: CIO perceptions on ICT Value and Strategy in the UK Financial Sector. ECIS 2003. Naples, Italy. <http://is.lse.ac.uk/wp/pdf/WP123.PDF>; Accenture (2006): The Innovator's Advantage. London. [http://www.accenture.com/global/research\\_and\\_insights/policy\\_and\\_corporate\\_affairs/ceoandcioviews.htm](http://www.accenture.com/global/research_and_insights/policy_and_corporate_affairs/ceoandcioviews.htm); IBM Global Business Services (2006): Expanding the Innovation Horizon – The Global CEO Study 2006[http://www.ibm.com/innovation/us/pointofview/enterprise/mar27/ceo\\_study.html](http://www.ibm.com/innovation/us/pointofview/enterprise/mar27/ceo_study.html)

<sup>28</sup> [www.secondlife.com](http://www.secondlife.com)

<sup>29</sup> Zuboff & Maxmin provides and extensive discussion of the problems associated with what they call transaction as opposed to relationship economics in terms of providing customers essential support: Shoshana Zuboff and James Maxmin (2002): The Support Economy: Why Corporations are Failing Individuals and the Next Episode of Capitalism. London. Penguin.



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<sup>30</sup> Claudio U. Ciborra (1996): The Platform Organization: Recombining Strategies, Structures, and Surprises. *Organization Science*. vol:7. no:2. pp:103-118; Bo Dahlbom (2000): *Networking: From infrastructures to networking*. Planet Internet. Lund, Sweden. Studentlitteratur.

<sup>31</sup> James Brown (2006): NHS Direct unites databases.  
Computing <http://www.computing.co.uk/computing/news/2166759/nhs-direct-unites-databases>

<sup>32</sup> Shoshana Zuboff and James Maxmin (2002): *The Support Economy: Why Corporations are Failing Individuals and the Next Episode of Capitalism*. London. Penguin.

<sup>33</sup> [www.payasyoudriveinsurance.co.uk](http://www.payasyoudriveinsurance.co.uk), GPS= Global Positioning System

<sup>34</sup> Robert Scoble and Shel Israel (2006): *Naked Conversations: How Blogs are Changing the Way Business Talk with Customers*

<sup>35</sup> Carsten Sørensen and David Gibson (2004): Ubiquitous Visions and Opaque Realities: Professionals Talking About Mobile Technologies. *INFO: The Journal of Policy, Regulation and Strategy for Telecommunication, Information and Media*. vol:6. no:3. pp:188-196

<sup>36</sup> Jeffrey M. O'Brien (2006): Seagate CEO: I help people "watch porn". *Fortune*. no:November 30th <http://money.cnn.com/2006/11/30/magazines/fortune/obrienseagate.fortune/>

<sup>37</sup> This has been argued in terms of creative destruction, borrowing Schumpeter's concept. The argument forwards that email, fixed-line telephones, faxes and mobile phones has supported members of organisations to creatively destruct organisational rigidity, thereby allowing the organisation to be more responsive to market needs through allowing more direct interaction criss-crossing the hierarchical boundaries: Joseph A. Schumpeter (1975 (orig. pub. 1942)): *Creative Destruction. Capitalism, Socialism and Democracy*. pp:82-85. New York. Harper.

<sup>38</sup> Maxine Robertson, Carsten Sørensen, and Jacky Swan (2001): *Survival of the Leanest: Intensive Knowledge Work and Groupware Adaptation*. *Information Technology & People*. vol:14. no:4. pp:334-353