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Author:
Vidgen, Richard

Publication details:
High Performing Workplaces

Publication Date:
2010

DOI:
https://doi.org/10.26190/unsworks/745

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High Performing Workplaces: how to assess the contribution of ICT

Richard Vidgen

School of IS, Technology and Management, Australian School of Business

University of New South Wales

Sydney, NSW 2052, Australia

tel. +61 (0)2 9385 7125, email: r.vidgen@unsw.edu.au

Abstract

High performing workplaces have variously been defined as 'high-commitment management' (Arthur 1994; Pfeffer 1998), 'high performance work systems' (e.g. Becker & Huselid 1998) and 'high-involvement management' (Guthrie 2001). The ICT review presented here forms part of a larger programme of research investigating high performance workplaces that incorporates a broad set of practices including leadership, culture, industrial relations, HRM practices, organizational structure, and management controls. ICT management and ICT deployment and use are therefore but one part of a complex arrangement of resources and practices through which firms innovate and create value.

1   Background: What is a High Performing Workplace?

In the introduction to a report on high performing workplaces Boedker et al. (2010) write:

"High performing workplaces have variously been defined as 'high-commitment management' (Arthur 1994; Pfeffer 1998), 'high performance work systems' (e.g. Becker & Huselid 1998) and 'high-involvement management' (Guthrie 2001). Arundel et al (2007) examine 'high-commitment' and 'high-involvement' management practices across firms in 15 European countries. They find that *Discretionary Learning Organisations* outperform Lean *Production, Taylorist* and *Traditional* firms. A learning organisation has high levels of learning and task complexity with much responsibility for decision making and problem solving allocated to employees. Furthermore, work is organised to stimulate interaction between people with a diverse set of experiences and competences. This increases knowledge transfer and ensures that changes in customer needs and preferences are spotted and responded to resulting in the continuous development of new competencies, products and processes. In short, learning organisations are those firms that have transitioned from a hierarchical, top-down, approach to management, to one where self-control, innovation and empowerment are of at least equal importance."

Boedker et al. (ibid) go on to explain that high performing organisations are those that:

- Achieve high levels of **employee engagement** and quality of life;

- Excel at **innovating** and creating new products, services and business processes that meet, even supersede, customer expectations and ensure organisational longevity;
- Achieve sound levels of **productivity** and financial performance;
- Provide **fairness** for people at work and for the stakeholders and communities it serves.

In this paper we take the broad context of the high performing workplace and consider the role of ICT. The following is taken from Boedker et al. (2010) and extended.

2 Information and Communication Technology

Despite the considerable investment in ICT by organisations in the 1990s there was little evidence that this investment led to increases in national productivity, , a phenomenon referred to as the "IT Productivity Paradox" (Brynjolfsson, 1993). More recently evidence is emerging that supports a link between ICT investment and firm performance, e.g., OECD (2004). Australia has performed particularly well in ICT investment with Keane (2008) reporting that IT investment contributed about one third of the labour productivity growth rate of 3.1 per cent over the period 1993 to 2000. These improvements arise from multifactor productivity (MFP) growth, in which two or more of the following are present: the introduction of new technology, improved workforce skills and education (labour quality), economies of scale and better management and work practices (ibid,). Thus, the improvement in firm performance attributable to ICT investment is associated with complementary investments and changes in human capital, changes in organisational structure, new work designs, and greater employee engagement (Black and Lynch, 2002).

Arvanitis and Loukis (2009) summarise the "New Firm Model" as one in which:

- organisations replace the mass production model focusing on manufacturing with a flexible, multiproduct approach emphasising quality and market responsiveness and taking advantage of technological advances and new organisational forms (Milgrom and Roberts, 1990);

- there is a shift from 'tayloristic' organisation to 'holistic' organisation characterised by job rotation and learning across tasks (Lindbeck and Smower, 2000);

- change is skill-based and requires complementary systems of ICT, workplace organisation, and innovation (Bresnahan et al. 2002).

Arvanitis and Loukis (2009) conclude that a "common characteristic that is central in all these types of studies is the existence of complementarities among several factors which mutually enhance their impact on firm performance." (p. 44). Principal complementarities are ICT, organisational practices, and human capital. However, in a review of recent studies of Arvanitis and Loukis (ibid.) note that although most of these studies find a statistically significant positive effect on performance for ICT and organisational capital (OC) only a few find a similar effect for human capital (HC) and performance (Table 1, p. 46). An exception is the Australian study

conducted by Gretton et al. (2002) which finds ICT, OC, and HC to have a significant impact on business performance and further finds evidence of complementarities between ICT and OC and ICT and HC.

2.1 Types of ICT in the Workplace

The term "ICT" was coined to mark the convergence of computing and communications. The Canadian statistics office[1] definition is "ICT includes technologies such as desktop and laptop computers, software, peripherals and connections to the Internet that are intended to fulfil information processing and communications functions." While ICT refers to technologies, an information system (IS) comprises people and machines and represents "a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organisation" (Laudon and Laudon, 2008). We are interested in ICT *applications*, i.e., how ICT is used as part of a broader IS in an organisational context to some purpose.

ICT application types

We categorise ICT applications as follows:

- **Enterprise** – supporting business operations through specifying business processes (tasks and sequences), e.g., enterprise systems such as SCM (back office) and CRM (front office), support systems (e.g., self-service procurement via third party market places and online employee services such as expense claims), and generic business process management (BPM) technologies.

- **Informational** – support decision making for senior managers (strategise, scan environment, set policies, allocate resources), middle management (carry out plans of senior management), and operational management (monitor and control day to day operations). Will involve use of information collected by enterprise systems and data warehousing, data-mining, and decision support technologies.

- **Collaborative** – facilitates interactions without specifying their parameters, without specifying tasks and sequences, and use tends to be optional. Examples include email, instant messaging, wikis, blogs, social networking sites, and mash-ups. These technologies form part of the Web 2.0 phenomenon and are characterised by user generated content and collaboration giving power to individuals and communities.

- **Functional** – used to support the execution of discrete tasks, e.g., the use of spreadsheets, simulators, CAD, and statistical software.

McAfee (2006) identifies four complements that are needed to use IT effectively: 1. better-skilled workers, 2. higher levels of teamwork, 3. redesigned processes, and 4. new decision rights. Different types of ICT application require different levels of complement, such that functional IT applications may not require complements while enterprise applications do require complements and are likely to involve organisational change and generate resistance.

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[1] http://www.statcan.gc.ca/pub/81-004-x/def/4068723-eng.htm

Web 2.0 Technologies

Web 2.0 technologies are being used increasingly in the workplace, particularly blogs, wikis, and social networking sites (SNSs) (McKinsey, 2008). In a survey of nearly 2000 companies McKinsey (2008) find that the primary use of Web 2.0 is for managing knowledge and collaboration (internal applications), improving customer service and acquiring new customers (interfacing with customers), and achieving better integration and tapping into expert knowledge (interfacing with partners/suppliers). They identified the most significant barriers to Web 2.0 adoption in enterprises as: lack of understanding of potential financial return, a culture that does not encourage the use of Web 2.0 technologies, and insufficient incentives to adopt or experiment with Web 2.0 technologies.

2.2   ICT Benefits

The benefits of ICT for a firm include (Arvanitis and Loukis, 2009):

- savings on inputs and general cost reductions
- greater flexibility and improvements in product quality
- savings on labour or on some specific labour skills
- reduction in capital needs through, for example, increased utilization of equipment and reduction in inventories or space requirements
- higher product quality
- better product development conditions
- increased flexibility of the production process
- allowing for the exploitation of economies of scale
- improved networking and communication between employees (reduced cost of lateral communication and reduced coordination costs)
- improved monitoring can reduce the number of supervisors required in the production process

There are less tangible benefits from IT, such as:

- Internal/Management
    - Employee morale, product development, organisational flexibility
    - Improved planning, more timely information, improved decision-making
    - Organisational learning/knowledge management
- External/Strategic
    - New products and new channels to market
    - Customer service, enterprise image, market development
    - Create competitive advantage, build barriers to entry, enhance differentiation

With respect to external/strategic use of ICT, Bergeron et al. (2001, 2004) developed a scale for assessing the strategic use of IT. Their survey was conducted with SMEs and with the CEO as respondent and these items capture the potential benefits of ICT well.

<u>Securing Benefits from ICT</u>

There are numerous reasons why firms fail to get value from their ICT investments. We summarise these into three areas: lack of attention to complementarities, poor fit of ICT and work practices, and poor governance. A fourth factor needs to be considered: whether ICT is being used in an ethical way.

Complementarities: as noted above, achievement of these benefits does not arise from a simple technology investment; it will likely require complementary investments in organisational capital and human capital and changes to organisational form and work design, particularly to secure the strategic benefits (e.g., the creation of competitive advantage).

Work design: even when it is possible to railroad the ICT into the organisation it may not be productive despite seeming a perfectly rational thing to do. This problematical theme has been investigated by Sachs (1995) who describes a case study of a Trouble Ticketing System (a database for recording and scheduling jobs) in which new technology and new working practices are introduced. On the face of it, the new technology and redesigned work processes should have led to gains in efficiency. Unfortunately, in actuality, the opposite happened – work became less efficient. The systems analyst had failed to understand how the experienced maintenance engineers shared their knowledge through informal mentoring schemes, how knowledge was shared through social interaction (the 'coffee machine' effect), and how the new data entry requirements would slow productivity (Vidgen et al., 2002).

Governance: IT governance is the top management concern of controlling IT's strategic impact and its delivery of value to the business, to manage have oversight of cost and time and to ensure that IT plans change as circumstances change (Weill & Ross 2004). Organisations with appropriate governance structures, such as an IT steering committee, perform better than those that don't (Weill, 2004).

Ethical use of ICT: even if the complementarities and fit with work practices are addressed there remains the question of whether the use of ICT is fair and ethical. Greenbaum (1995) in "Windows on the Workplace" reports on call centres:

> "There's AHU, that's After Hang Up time. It's supposed to be fourteen seconds. It just came down to thirteen. But my average is five seconds AHU, because I do most of the work while the customer's still on the phone. There's your talk time, your availability, your occupancy - that's the percent of time you're plugged in, which is supposed to be 98 percent …."

Although intensification of work through the use of ICT is not necessarily a 'bad' thing (indeed, it may lead to more fulfilling work for the individual and increased productivity for the firm), there is a potential for ICT to erode worker autonomy. For example, the UK's Guardian newspaper's (28 January 2006) investigation into call centres reported:

> "At scrupulous companies such as Converso, the cold callers have control over their auto-diallers. They can press a pause button whenever they like and stretch their legs or whatever. But at crueller companies the auto-dialler is like a runaway train: there is no pause button, no respite, one must cling on or die … After six months of the auto-dialler you just want to shoot yourself in the head."

The inappropriate intensification of work through the use of ICT will likely contribute to workplace stress and have a negative impact on employee quality of life.

2.3   Levels of ICT Investment

A simple measure of the IT input for a firm is the IT expenditure per employee (e.g., Byrd et al. 2006). As to what constitutes expenditure, Huang et al. (2006) define IT Investment as the sum of hardware expenses, software expenses, maintenance expenses, training expenses, and personnel expenses. Dibrell et al. (2007) used a four-item scale that asked respondents to report their (1) total dollar value of IT assets; (2) total IT investment; (3) number of IT employees; and (4) number of personal computers and terminals per employee.

Youndt et al. (2004) provide a more sophisticated view of the ICT investment, looking at measures such as the percentage of employees with desktop computing and the percentage with access to the Internet.

2.4   Strategic Alignment

The Society for Information Management (SIM) commissions a survey on a regular basis to discover the key management concerns of chief information officers (CIO). The alignment of IT and business has been a consistent high coring item and was ranked number 1 in 2003, 2004, 2005, and 2006 and was the second most important issue in 2007 (Luftman et al., 2006; Luftman and Kempaiah, 2008).

Chan (2002) defines strategic alignment as "the fit between the priorities and activities of the IS function and the business unit" and say that the goal in strategic alignment is for "IS priorities, capabilities, decisions, and actions to support those of the entire business." When Campbell (2005) asked the participants of a focus group to define alignment the deceptively simple response was "Alignment is the business and IT working together to reach a common goal." The term "fit" is also used extensively, from Henderson and Venkatraman (1993) on. Shams and Wheelers's (2003) definition captures the intertwinedness of business and IT of alignment as "convergent intentions, shared understanding, and coordinated procedures" (p. 66). Chan and Reich (2007a, 2007b) provide an extensive overview of the research into alignment.

Byrd et al. (2006) find evidence for strategic alignment as a moderating affect on the relationship between IT investment and firm performance.

2.5   User Satisfaction and ICT

There is a substantial body of literature on user satisfaction with IT and user acceptance of IT, notably Davis' (1989) technology acceptance model (TAM), which is grounded in the theory of planned behaviour and more latterly the theory of planned action. The IS Success model developed by DeLone and McLean (1993) identify multiple dimensions of IS success - information quality, system quality, and service quality – and their impact on user satisfaction.

A fundamental aspect of the TAM is that people use IT because it is perceived to be useful in their job or role. The UTAUT (Venkatesh et al., 2003) attempted to unify the various TAM variants and identifies further factors that

affect IT adoption, including social influence (do others in the organisation encourage the use of the technology) and facilitating conditions (does the user have the resources and knowledge to deploy the technology).

<u>ICT infusion</u>

Sundaram et al. (2007) identify three constructs relevant to individual perceptions of ICT:

- Frequency: how frequently an employee uses ICT
    - i.e., how *often* an employee uses ICT
- Infusion: the extent to which the full potential of ICT is embedded in an organisations managerial and work systems
    - i.e., how *well* an employee uses ICT
- Routinisation: the extent to which ICT has been integrated into the employee's normal work routine
    - i.e., how *efficiently* an employee uses ICT

Whereas the TAM is concerned with future intentions to use technology, the infusion model is concerned with how well the technology is working for the user. In the context of high performing workplaces an indication of the extent of ICT use by employees and whether that ICT is helpful in performing work should be particularly relevant.

2.6 Virtual Workplaces

Crandall and Wallace (1998) define the virtual workplace as "where work is done anytime and anywhere, and not bound by the traditional limitations of time, physical space, job descriptions, title, and pyramidal reporting relationships" (p. 19). Akkirman and Harris (2005) take this as providing the flexibility to work at any time and in any place through information and communication technologies. The virtual workplace includes telecenters, teleworking, hot-desking, hotelling, and virtual offices and for many the virtual workplace is an increasingly preferred and ubiquitous workplace (Akirrman and Harris, 2005). Effective communication is essential to organisations – poor communication correlates with lower commitment, reduced productivity, increased absenteeism, and higher turnover (Hargie et al., 2002). Staples (2001) finds that employees in a virtual workplace had lower levels of job satisfaction and trust that could be attributed to poor communication.

Akkirman and Harris (2005) compared virtual and traditional office workers in terms of personal feedback, communication climate, relationship with supervisors, horizontal and informal communication, and organisational integration, and overall communication satisfaction. Counter to expectation, the results showed that virtual workers had higher levels of communication satisfaction than traditional workers.

2.7 Recommendations for the evaluation of ICT in the workplace

The findings of the literature review are summarised in Figure 1. Management practices with respect to ICT affect the provision of ICT in the workplace, while the employee dimension reflects acceptance and use of ICT. To investigate the ICT dimension of firm performance the research design will consider both management (CFO and HR manager) actions and perceptions and employee perceptions of ICT.

The CFO survey (Appendix A) asks about levels of financial ICT investment (annual ICT budget) and requests further details of non-financial investment indicators, e.g., the percentage of employees with desktop computing devices, the number of people in the IT department. The CFO is also asked to assess the extent and quality of the firm's ICT provision and to assess the types of technology used and their relative importance to the firm (e.g., communication software, enterprise systems). From a strategic perspective the CFO is asked how ICT is used in the firm (e.g., to save cost, to improve product quality) and how ICT strategy and business strategy align. We hypothesise that a higher level of ICT investment, when aligned with business strategy, will be positively associated with a higher level of firm performance.

Although the bulk of the ICT questions are directed toward the CFO the HR Manager (Appendix B) are asked what percentage of employees are virtual workers. High levels of virtual working will require higher levels of ICT investment and ICT effectiveness.
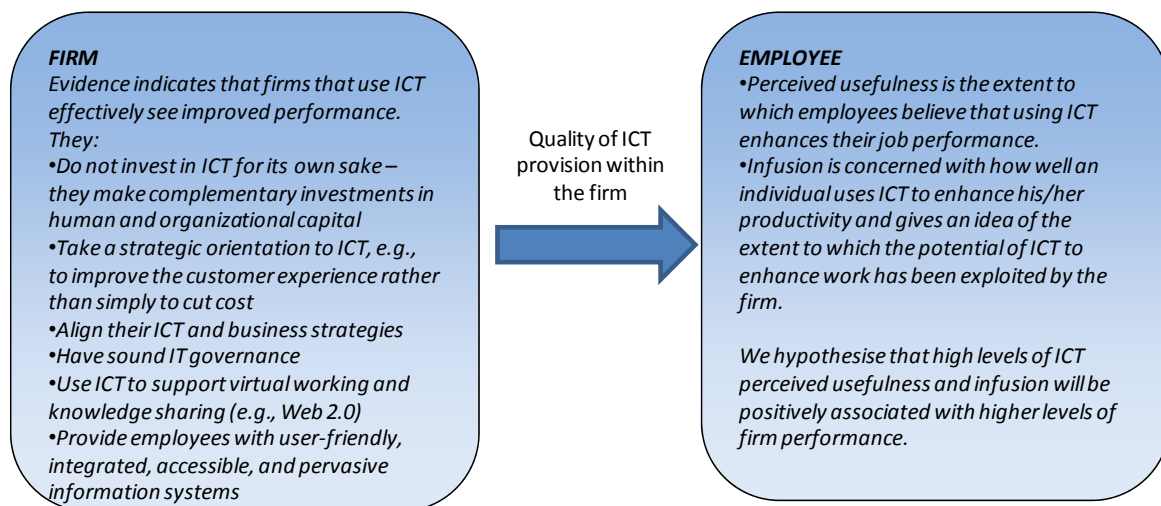

FIRM
Evidence indicates that firms that use ICT effectively see improved performance. They:
•Do not invest in ICT for its own sake – they make complementary investments in human and organizational capital
•Take a strategic orientation to ICT, e.g., to improve the customer experience rather than simply to cut cost
•Align their ICT and business strategies
•Have sound IT governance
•Use ICT to support virtual working and knowledge sharing (e.g., Web 2.0)
•Provide employees with user-friendly, integrated, accessible, and pervasive information systems

Quality of ICT provision within the firm

EMPLOYEE
•Perceived usefulness is the extent to which employees believe that using ICT enhances their job performance.
•Infusion is concerned with how well an individual uses ICT to enhance his/her productivity and gives an idea of the extent to which the potential of ICT to enhance work has been exploited by the firm.

We hypothesise that high levels of ICT perceived usefulness and infusion will be positively associated with higher levels of firm performance.

Figure 1: the role of ICT in high performing workplaces

For the employee survey (Appendix C) we ask about perceived usefulness of the firm's ICT and ICT infusion. Perceived usefulness is the degree to which a person believes that using ICT enhances his or her job performance. This construct is applicable to all employees, regardless of the type of ICT they use and their role or level in the organization. We hypothesise that high levels of perceived usefulness of ICT will be positively associated with higher levels of firm performance. The construct will also give an idea of how well the ICT fits with the actual work practices of employees. ICT infusion gives an idea of the extent to which the potential of ICT to enhance work has been exploited, i.e., how well the employee uses ICT. We hypothesise that high levels of using ICT well will be positively associated with higher levels of firm performance.

Employee data is averaged to provide firm level measures and the data analysed at the firm level using PLS (partial least squares) software to model the impact of ICT on firm performance. Further measures from the high performing workplace study are needed to assess the complementarities to ICT investment, e.g., human and organisational capital.

Appendix A: ICT items in the CFO survey

Construct: Level of financial investment in ICT

Rationale:
Other financial measures are absolute measures of "investment" in resources associated with key areas in the conceptual model. Hence, total ICT expenses (Qn 30) relates to constructs on strategic use of ICT, ICT provision, usage and importance of ICT; total HR expenses (Qn 31 and 32) is an investment measure accompanying the HR constructs in the conceptual model, Research and Development expenses (Qn 38) relate to constructs around Innovation.

Items (adapted from the survey supplied by Youndt as used in Youndt et al. 2004):

Last day of financial Year	......./......./........	......./......./........	......./......./........
Total Information and Communication Technology (ICT) expenses (please include salaries and wages of ICT personnel, leasing, finance charges, depreciation, outsourcing, communications and all other ICT costs)			

Construct: Strategic use of ICT

Motivation: Use of ICT for strategic rather than operational purposes has been shown to affect firm performance

References: Bergeron, F., Raymond, L., & Rivardo, S., (2001), Fit in strategic information technology management research: an empirical comparison of perspectives. Omega, 29, pp. 125 – 142;

Byrd, A., Lewis, B., & Bryan, R., (2006). The leveraging influence of strategic alignment on IT investment: An empirical examination. Information & Management 43, pp. 308-321;

Items Bergeron et al., 2001 (op cit)

Use of ICT to reduce your production costs	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Use of ICT to make substantial savings	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Use of ICT to improve your firm's productivity	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Use of ICT to improve your firm's profitability	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Use of ICT to improve the quality of products or services	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Use of ICT to improve the customer experience	Strongly disagree	1	2	3	4	5	6	7	Strongly agree

Construct: ICT provision

Motivation: The following measures capture the CFO's perceptions of the level of ICT provision in the organization. This assessment can be compared with employee assessments of infusion.

Reference: Items (adapted from Youndt, M., Subramaniam, M., and Snell, S., (2004), Intellectual Capital Profiles: An Examination of Investments and Returns. Journal of Management Studies, 41(2), pp. 335-361)

Our ICT systems are accessible to employees	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Our ICT systems are user-friendly	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Our ICT systems are integrated with each other	Strongly disagree	1	2	3	4	5	6	7	Strongly agree

Construct: ICT usage and importance

Motivation: Organizations that make greater use of collaborative technology will likely be better at knowledge sharing and be more innovative (explore). Those that focus on transactional systems will likely emphasise exploitation.

Reference: Items (adapted from Levenson 2009 (op cit), Arvanitis, A., & Loukis, E. N. (2009), Information and communication technologies, human capital, workplace organisation and labour productivity: a comparative study based on firm-level data for Greece and Switzerland. Information Economics and Policy, 21, pp. 43-61.

For the following items rate how important each of the technologies is for personnel getting work done in your firm. In the right-hand column indicate the percentage of employees that use the technology in their routine work.

Communications (e.g., email, instant messenger - IM)	Not important	1	2	3	4	5	6	7	Very important	Personnel using the technology in their routine work ....%
Information repositories (e.g. intranet, shared databases, data warehouses)	Not important	1	2	3	4	5	6	7	Very important	Personnel using the technology in their routine work ....%
Collaborative software (e.g. video-conferencing, online forums, social networking software, blogs, Wikis)	Not important	1	2	3	4	5	6	7	Very important	Personnel using the technology in their routine work ....%
Enterprise systems (e.g. ERP, CRM)	Not important	1	2	3	4	5	6	7	Very important	Personnel using the technology in their routine work ....%
Internet (external searching)	Not important	1	2	3	4	5	6	7	Very important	Personnel using the technology in their routine work ....%

Construct: ICT investment (non-financial)

Measures: (adapted from the survey supplied by Youndt as used in Youndt et al., 2004 (op cit)

Approximately what percentage of the firm's employees has desktop computing devices (PC's, workstations, laptops, etc.)?   ....%

What percentage of the firm's employees has mobile devices (PDAs, smartphones, etc.)?....................%

What percentage of the firm's employees has access to the internet?   ....%

Does the firm use technology to block access to certain Internet sites?   YES / NO

Does the firm have an intranet?   YES / NO

How many IT personnel are employed or contracted by your firm?   ....%

Construct: Strategic alignment of ICT

Motivation: The alignment of ICT and business strategies has consistently been the number one issue for CIOs and alignment has been shown to have an impact on firm performance (Byrd et al. 2006). The alignment practices assess the process capability of the organization in aligning business and IT strategies. Further, alignment practices tie to governance practices, e.g., IT projects have business sponsors, and good governance is known to be associated with performance (Weill, 2004).

Reference: Bergeron et al. 2001(op cit); Byrd et al. 2006 (op cit),

Items: adapted from Chan (2002):

Please indicate if you mostly agree or mostly disagree with the following statements by circling either the 'YES' or 'NO' alternative in respect of each of the statements below.

The CEO and CIO / IT Manager have a strong working relationship	YES / NO
The firm's business and IT plans are closely linked	YES / NO
IT personnel participate in business planning	YES / NO
IT projects have business champions	YES / NO
IT personnel make lateral short- or long-term transfers into business partner areas	YES / NO
The firm has an IT Steering Committee	YES / NO

Appendix B: ICT items in the HR Manager survey

Motivation:

Virtual working may have an impact on firm performance. The evidence for employee satisfaction is mixed (positive for Akirrman and Harris, 2005, negative for Staples, 2001). Regardless, flexible working will need to be supported by effective ICT provision.
Source: Akkirman and Harris (2005)

1. What percentage of your workforce are virtual office workers? _____

   Note: a virtual worker is a worker who does not have to come to the office on a regular basis and is able to work at anytime and anywhere they want.

Appendix C: ICT items in the Employee survey

Employee perceptions of ICT usefulness

Description:

Perceived usefulness of ICT or the degree to which a person believes that using ICT enhances his or her job performance.

Motivation:

For employees we will ask about perceived usefulness of the firm's ICT. This construct should be applicable to all employees, regardless of the type of ICT they use and their role or level in the organization. We hypothesise that high levels of perceived usefulness of ICT will be positively associated with higher levels of firm performance. The construct will also give an idea of how well the ICT fits with the actual work practices of employees

Reference:

Venkatesh, V. Morris, M. G., Davis, G. B., and Davis, F. D. (2003), User Acceptance of Information Technology: toward a unified view, MIS Quarterly, 27(3), pp. 425-478.

Please answer the following questions about your use of information and communication technology (ICT) systems										
1. Using ICT systems enables me to accomplish tasks more quickly	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
2. Using ICT systems makes it easier to do my job	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
3. Using ICT systems increases my productivity	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
4. I find the ICT systems useful in my job	Strongly disagree	1	2	3	4	5	6	7	Strongly agree

Efficient Use of Technology

Description:

The construct of Infusion is how well an individual uses ICT to enhance his/her productivity.

Motivation:

ICT infusion gives an idea of the extent to which the potential of ICT to enhance work has been exploited. We hypothesise that high levels of using ICT well will be positively associated with higher levels of firm performance.

Reference:

Sundaram, S., Schwarz, A., Jones, E., and Chin, W., (2007), Technology use on the front line: how information technology enhances individual performance. Journal of the Academy of Marketing Science, 35, pp. 101–112.

Please answer the following questions about your use of information and communication technology (ICT) systems									
1. I am using ICT to its fullest potential for supporting my own work	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
2. I am using all the capabilities of ICT in the best fashion to help me on the job	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
3. I doubt that there are any better ways for me to use ICT to support my work	Strongly disagree	1	2	3	4	5	6	7	Strongly agree

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