The impact of ICT on the work patterns of managers and their organisations

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Abstract

Purpose – The main aim of this paper is to present the results of a study examining managers' attitudes towards the deployment and use of information and communications technology (ICT) in their organisations. The study comes at a time when ICT is being recognised as a major enabler of innovation and new business models, which have the potential to have major impact on western economies and jobs.

Design/methodology/approach – A questionnaire was specially designed to collect data relating to three research questions. The questionnaire also included a number of open-ended questions. A total of 181 managers from a wide range of industries across a number of countries participated in the electronic survey. The quantitative responses to the survey were analysed using SPSS. Exploratory factor analysis using Varimax rotation was used and ANOVA to compare responses by different groups.

Findings – The survey showed that many of the respondents appeared equipped to work "any place, any time". However, it also highlighted the challenges managers face in working in a connected operation. Also, the data suggested that many managers were less than confident about their companies' policies and practices in relation to information management.

Originality/value – A next step from this exploratory research could be the development of a model exploring the impact of ICT on management and organisational performance in terms of personal characteristics of the manager, the role performed, the context and the ICT provision. Also, further research could focus on examining in more detail differences between management levels.

Keywords Working patterns, Managers, Communication technologies, Management effectiveness

Paper type Research paper

Introduction

The main aim of this paper is to present the results of a study examining managers' attitudes towards the deployment and use of information and communications technology (ICT) in their organisations, how they use it, how they perceive it to be impacting on their personal effectiveness and that of their organisation more generally. The study comes at a time when ICT is being recognised as a major enabler of innovation and new business models, which have the potential to have major impact on western economies and jobs. The notion that managers have a key role in the successful implementation of new systems is now without question but much of their

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influence is in developing an organisational culture which is both receptive to new ways of working and ensures effective deployment and utilisation.

Results from a survey of 181 managers from a wide range of industries across a number of countries, primarily within the EU, are presented. Many of the respondents were from large firms and included were managers at all levels in the enterprise, but mainly, either senior within the business or a business unit.

The findings are presented alongside with implications for practice, with the objective of providing insights for further academic research into the impact of ICT onto management and organisational performance. Further areas for research are identified.

Background to the research

In 2000, the European Council published its e-Action Plan (Martin and Matlay, 2001) setting out a vision for individuals and organisations to be digitally literate and on-line. One of the principal aims was to increase the competitiveness of business. This is a particular concern in the EU where recent reports of comparative productivity show the EU falling well behind the US (Fassbender, 2007) and despite a recent increase in productivity growth, there is still a need to close the productivity gap with other major countries (HM Treasury, 2006).

Being online in itself, however, is not going to have the desired impact. Adoption appears to follow a route from email and a website to e-commerce, e-business and ultimately transformed organisations (Martin and Matlay, 2003). The UK's DTI (1998) proposed as an adoption ladder. For most large organisations investment in e-commerce has been essential for them to remain. Following on from the initial steps, the possibilities for business transformation have been explored and subsequently driven through in response to increasing globalisation of competition and changing business models.

But for many small and medium enterprises (SME's) progress up the adoption ladder is much slower as these firms, even if they have a clear vision of a future direction, are often resource constrained and limited in what they can absorb in the way of technological advance. In this sector, ICT adoption and implementation has been impacted by the approach adopted by the owner/manager (Martin and Matlay, 2001). Management commitment and perceptions of ICT benefits are important elements in the adoption of ICT. Earlier research (Thomas *et al.*, 1991, cited in Martin and Matlay, 2001) found that "a positive attitude to VET (vocational education and training) and sound information gathering skills considerably reduce ICT related adoption costs and uncertainty, thereby raising the likelihood of early implementation of new technology". The importance of perceptions of usefulness is also highlighted in a study by Karahanna *et al.* (1999). They report that firms with lower ICT understanding and knowledge are more likely to experience considerable problems in recognising the usefulness of ICT at each stage of development. Perceptions of usefulness may be related to specific factors such as gender, context and educational background. So there is little doubt that managers could prove a hindrance given their limited understanding of the potential of ICT.

Further evidence of the impact of managers on adoption of ICT is found in a report by the Work Foundation (Fauth, 2006), which concluded that businesses are failing to

make the most of their annual £50 billion investments in IT due in part to uninformed managers from a "lost generation" not having grown up immersed in technology.

Locke (2004) suggests that only where the SME has a growth objective and the owner/manager can see obvious advantages in its adoption will he/she set out to overcome the hurdles. Perceived barriers include the lack of information and lack of understanding on the part of business owners/managers. The gains in SME performance from ICT adoption related more to the impact of resulting cost cutting rather than increasing market share and level of sales. So in SMEs one can conclude that the owner/manager appears to have considerable influence on ICT adoption in the firm, but how much influence do managers in larger firms exert?

We assert that managers in organisations do have a strong influence over the adoption of ICT by their enterprises and hence its impact on organisational effectiveness. The degree of management support has been found to impact on adoption (Wang and Qualls, 2006). Whilst in many instances managers may feel that they have no real direct or indirect say over the business and IT strategies and resulting investment decisions, their particular influence is in the effectiveness of its introduction and deployment in the workplace, particularly in shaping the culture (Bunker *et al.*, 2007) and having social influence (Venkatesh *et al.*, 2003).

The observations of senior managers and the stories exchanged between them have been found to shape the "schemata" that guided their own behaviour. Moreover, Amabile and Kramer (2007) point out that the behaviour of the manager "dramatically shapes the employee's inner work life, defined as emotions, perceptions and motivations. This has a direct impact on both personal performance and that of the operation overall."

Where managers are themselves uncomfortable in their own use of the firm's ICT systems, this discomfort is likely to be passed on to staff through their language and behaviour. A consequence of this is likely to be slower embedding of new systems, with the risk of their full potential not being realised.

The top rung of the ladder of adoption is that of business transformation (Martin and Matlay, 2001). This implies considerable organisation change. The central role of middle managers in translating the "structural blueprints" defining the new organisation instigated by senior managers into operational reality is emphasised by Balogun (2007, p. 63):

> ... they have to grasp something they did not design and negotiate the details with others equally removed from strategic decision-making ... when individuals experience change, to understand the implications of these changes for themselves and to make sense of it as they exchange gossip, stories, rumours and past experiences, and take note of symbolic behaviours and action.

As long ago as 1991, in the *Harvard Business Review*, Keen (1991) pointed out that business cannot afford technology-illiterate managers any more than it can afford business-illiterate IT professionals. More recently, writing in *MIS Quarterly*, Reich and Benbasat (2000) reported that shared knowledge between line managers and information systems professionals is an important factor in bringing business objectives and IT objectives into alignment. It has been argued that for organisations to make effective use of developments in ICT, there needs to be shared responsibility for IT management between line managers and IT professionals. This involves an

input into strategic decisions, assuming ownership of IT projects within their area of responsibility and taking a leadership role in IT implementation.

The manager's enthusiasm for the use of IT is likely to have an impact. Moreover, according to Leonard-Barton and Deschamps (1988), employees low in management innovativeness were receptive to management encouragement and also a manager's experience using IT reflects a personal innovativeness towards IT and indicates receptivity to change. Since information is key to much productivity and economic growth, we have known for some time that managers must be encouraged to become strong workplace advocates of the effective use of technology.

So the way in which managers perceive the impact of ICT on both their own role and the overall performance of the organisation is going to influence their attitude and behaviour and, in turn, impact their staff. However, the management role is in a state of flux. ICT has enabled the development of the global marketplace. Increased intensity of competition is forcing companies to review their business model. The transfer of low-skill jobs to low-wage economies has a long history; but increasing challenges for knowledge jobs is coming from rapidly emerging economies. So reconfiguration of supply chains, off-shoring, mergers and alliances are all impacting on the organisation of activities and the manager's role.

In addition, ICT is enabling new ways of working – "any place, any time". In order to reduce overhead costs as well as recognising the need to enlarge the labour pool, flexible working schemes appear to be becoming more commonplace. Increasing demands from customers for 24/7 operations is also impacting on the lives of managers.

A recent report by the Economist Intelligence Unit (2007), based on a study of 375 executives worldwide, focused on the management of the mobile workforce. It was reported that over two-thirds had increased personal productivity by in excess of 20 per cent due to the use of mobile technology and 91 per cent believed that employees were substantially or somewhat more productive. This resulted from easier and faster access to people and reduced "dead time" when travelling as well as an improved level of responsiveness within the organisation. But the pressure of constant availability and the isolation from colleagues were seen as having the potential to reduce morale and neutralise productivity gains. The integration of mobile devises with applications into the core enterprise systems was seen as key in long-term productivity gains.

It is within this context of the increasing use and dependence on ICT and changing roles and expectations of managers that this study was carried out. It set out to address a number of questions:

- What use are managers making of electronic communication tools?
- What impact are electronic communications having on the working life and effectiveness of managers?
- What impact do managers perceive electronic communications are having on organisational performance?

Research methodology

A questionnaire was specially designed to collect data relating to the three research questions. It comprised a total of 131 questions in six sections.

Some of the questions were multiple-choice; where opinions were sought the questions required an answer on a Likert type five-point scale but three questions were open-ended and called for a qualitative response. The latter covered views on how today's information systems are impacting on working practices, on the organisation's culture and what is needed in the way of system development to improve management effectiveness.

The areas for questioning were informed by the literature review but no similar survey was identified covering topics included here. The draft questionnaire was refined following feedback received from academic experts, the sponsor and practising managers. The final version was transferred to an electronic format and trialled with practicing managers.

The survey was designed to collect data from respondents whose first language is not English. Feedback on the survey instrument was solicited from personal contacts in Germany, Sweden and Italy. The survey was sent out to various e-mail lists and undertaken anonymously. As a result no information is available about response rate.

A total of 181 managers (27 per cent) classified themselves as executive directors, 30 per cent senior managers, 32 per cent middle managers, 11 per cent junior managers) responded to the survey. They were employed in a wide range of business sectors with 17 per cent in IT, 12 per cent in manufacturing, 10 per cent telecomms, 10 per cent business services. The organisation size varied considerably but most of the firms surveyed were large organisations (27 per cent had 250-999 employees, 43 per cent had more than 1,000 employees; 53 per cent were companies with a turnover exceeding 100m Euros). The companies surveyed were based in several different countries, including 27 per cent in Germany, 22 per cent in the UK, 18 per cent in Sweden and 10 per cent in Denmark. The number of direct reports also varied considerably. The ages of those surveyed covered a wide spectrum as well with 20 per cent under 35, 51 per cent aged 35-44, 24 per cent aged 45-54 and 5 per cent 55 and over.

The businesses the managers worked for had recently experienced mixed fortunes, although over 50 per cent of them had increased their turnover in the last year, with 26 per cent experiencing a significant increase in turnover and 18 per cent a significant increase in profitability. Moreover, 72 per cent of respondents expected their business to continue an upward trend over the next five years.

Of the respondents, 15 per cent saw themselves as employed by organisations which, compared to sector peers, were pioneers in the adoption of ICT. A further 36 per cent believed their firms to be early adopters. A total of 37 per cent were in companies seen to wait for usage to be clearly established and 12 per cent were very cautious in investment.

The quantitative responses to the survey were analysed using SPSS. In addition to basic statistical checks, exploratory factor analysis using Varimax rotation was used to establish three factors covering organisational impact (impact on decision-making; impact on employee working practices; impact on the move to organisational flexibility) and three factors for personal impact (impact on relationships; impact on face-to-face interaction and personal profile; impact on communications volume). ANOVA was also used to compare the responses from different groups. Pearson Product Moment correlations were constructed to test for association. Quotes from the open-ended questions were used to illustrate more specific points emerging from the survey.

The results

Our survey showed that many managers appeared equipped to work "any place, any time": e-mail was accessible when working remotely to 88 per cent; access to centrally stored files to 66 per cent and to shared folders to 70 per cent. In addition, 65 per cent of respondents said they could access the company's management information systems when working remotely. However, few managers were equipped to take full advantage (see Table I).

Most managers had a basic facility enabling them to function remotely but for many it provided a simple communication tool rather than information services in support of decision-making.

As shown in Table II, for many managers, a considerable proportion of the working day was spent in meetings (47 per cent of the respondents stated that they spend more than 1 hour in meetings with 21 per cent over three hours). In our sample 26 per cent, spend one hour or more per day on conference calls. Moreover, managers spend time on the phone although, interestingly, 34 per cent spend less than one hour per day on average but 27 per cent claim to use it for two hours or more. Managers also use the internet (35 per cent for about one hour, 23 per cent for two or more hours) and use the company's intranet (19 per cent for one hour, 15 per cent for two or more hours). But the time spent on e-mails for many was quite considerable, 61 per cent spending two hours or more. Despite this 23 per cent also spend two hours or more travelling.

Most of our managers (50 per cent) claimed to respond to e-mails as they arrived, but many prioritised – "depending on relevance and urgency", "according to importance". Only 12 per cent felt that at least 75 per cent of their e-mails were essential to the job; 31 per cent thought that just half of them were essential; 35 per cent saw just a quarter of the e-mails they receive as being essential while 21 per cent indicated that just 10 per cent of received e-mails were essential. When asked about importance (see Table III) the response was more positive, as one might have expected, although 31 per

Table I. Portable devices accessible almost invariably during the working day

Portable device available during the working day	% of respondents
Mobile phone	68
PDA/Blackberry	35
Transportable PC	7
None of the above	2

Table II. The way managers spend their time

	None	Under 1 hour	1 hour	2 hours	3 hours	4 + hours
In meetings	1	15	26	36	15	6
On conference calls	22	52	18	6	1	1
On the phone	–	34	40	20	5	2
Using the internet	6	36	4	20	5	2
Using the company's intranet	10	56	19	9	1	6
Dealing with e-mails	–	8	31	36	13	13
Reading journals/papers	13	62	21	2	2	1
Analysis/report writing	4	22	48	13	8	5
Travelling	14	37	26	16	3	5

cent of respondents reported that 50 per cent were irrelevant. So for many managers this means significant time wasting. Only 8 per cent of our managers responded to e-mails outside working hours.

E-mails also generate responses: 13 per cent of our respondents reported five to six rounds of discussion being generated on average by each e-mail. However, 41 per cent experienced three to four rounds and 46 per cent up to only two. To add to the difficulties in using e-mails, 43 per cent of managers felt that only 10 per cent of e-mails clearly conveyed the intended message while 30 per cent indicated that only 25 per cent did so. This may well account for much of the subsequent traffic. But a senior manager responsible for commercial search strategy in a global US content provider highlighted what he sees as a more general communications problem:

> I have worked for a global internet company for over six years – my view is that it is not the medium but the way it is used that is the problem. Poor communication skills manifest themselves in e-mail, on the phone, and in face-to-face meetings – they do not discriminate against e-mail and other electronic media. Some people in our company do not know when to pick up the phone and try to discuss complex issues via email in front of large audiences – this is bad practice (Senior manager, commercial search strategy in a UK-based firm).

Despite the extent to which e-mails were apparently dealt with by managers at the work place, for some, due to the accessibility of electronic systems anytime, anyplace, work has become more intrusive into life outside work with attendant disadvantages as illustrated by comments from two respondents:

> You are never away from work. Neither on business trips, nor on evenings/weekends. Theoretically you could be available anywhere/anytime. Even when ill, one is tempted to be on-line all day – to catch up with the daily business (Head of Sales in a division of a large Swedish engineering company).

> Blackberry = Crackberry. The temptation to check for anything important late at night and at weekends is very hard to resist. The advantage is that I can use my train journey to manage my emails. The downside is that the train becomes an extension of the office, not a refuge from it (UK marketing director working in financial services).

But many also recognised the positive benefits in terms of new opportunities and the quality of life to be balanced against the personal cost: "enhancement of self-esteem in front of customer"; "connectivity giving new business opportunities; the flexibility to regularly work for home"; "keeping in regular contact with family when travelling".

So, overall, we get a picture of much management time, during working hours, being spent on e-mails where often the intended message was unclear and other media might have been more appropriately used. Hence, although much e-mail traffic was non-essential, at the same time managers have to sort out what was relevant for their

Table III.
Percentage of e-mails essential, important and irrelevant to the manager's job

	All or most (%)	About 75% (%)	About 50% (%)	About 25% (%)	About 10% (%)	None (%)
Essential to job	2	10	31	35	21	2
Important but not essential	2	4	30	54	10	–
Irrelevant	6	3	22	45	26	4

own decision purposes. Additionally, for some, systems encroach into their personal life outside work, although the proportion admitting this was not high. Whilst this appeared to be the result of the manager's personal choice some comments indicate an increasing organisational expectation as illustrated by two managers:

> All work can be done quicker, better, faster, but this only means more work is allocated. People are busier than ever before even though they have computer-based information systems.

> Often a sneaky look at e-mails occurs in the evenings and weekend leading you to respond to them, feeling a cultural expectation to do so. It becomes almost a competition.

But managers develop coping strategies, e.g. one manager reported rarely taking his laptop when travelling on business so as to focus on the work in hand and have time to think.

But how were managers actually using the systems? Based on an examination of the Pearson Product Moment Correlations three groups of managers can be identified:

(1) Managers with a strong external focus primarily with customers.

(2) Those dealing primarily with suppliers.

(3) Those who make use of systems for decision-making.

Where respondents made more use of systems for communicating with customers, they were also likely to spend more time on the internet and in dealing with e-mails but also make more use of systems for networking internally. Whilst they were more likely to forward e-mails to colleagues, their use of e-mails internally was relatively low. They were also likely to have frequent electronic contact with suppliers. E-mail uses up considerable time for these respondents. But they were more likely to report deleting e-mails without opening them! A positive impact was reported on personal relations.

Looking now at those who use the systems extensively for communicating with suppliers, they were more likely also to use it for searching externally to support decision-making. Whilst they also spend considerable time on external e-mails and in networking they do report a higher proportion of e-mails as essential to their job. These managers also believed the systems had had a positive impact on their effectiveness when away from the office.

A third grouping of users appeared to make more use of systems for group decision-making. This group were bigger users of the internet, appeared to read journals and papers, search externally for information to support decision-making and network electronically both internally and externally. They also used systems for reviewing and auditing decisions in order to take action against third parties. These managers seemed to make more use of the systems to perform work of an analytical nature. They also saw the systems as increasing their personal effectiveness when outside the office.

Again based on Pearson Product Moment Correlations we can see that those who were more experienced users of e-mail were more likely to spend higher amounts of time dealing with their e-mail and network with suppliers and customers more as well as participate in external communities of practice. They also had fewer e-mails with internal contacts, forwarded fewer e-mails to colleagues and had a system for prioritising.

So given this apparent questioning of the utility of time spent on digital work and its impact on the manager, was the pay off in terms of the organisation's performance as positive as some had predicted? This is the next issue we turn our attention to.

In our analysis we have created three measures of the impact on the organisation based on factor analysis and including the following questions:

(1) *Organisational flexibility and effectiveness.* (Enabled off shoring of back office services; knowledge-based work and manufacture; facilitated more cost-effective working with customers/clients and within the supply chain; enabled more cost-effective ways of generating new sales; enabled move to 24/7 operation).

(2) *Decision-making effectiveness*. (Reduced costs; improved quality and speed of both strategic and operational decision making).

(3) *Impact on working patterns.* (The extent of flexible/teleworking amongst managers, professionals and support staff; the impact on staff perceptions of involvement and understanding of key decisions).

As shown in Table IV, where the organisation was seen as operating effectively as a more networked operation, this was believed to have a positive impact on overall effectiveness ($r^2 = 0.408$). However, decision-making effectiveness was not seen as relating to overall operations effectiveness.

However there were issues around the effectiveness of decision-making where virtual working was on the increase, including comments from respondents such as "passing the buck", "information overload impacting on the proactivity of correspondents", "slow responses to important issues due to a lack of prioritisation" and "patchy up-take across the organisation".

Despite considerable organisational experience of introducing ICT and managing change, concerns were still evident that some staff, reluctant to change, were being left behind.

		Impact on overall effectiveness of operations	Decision-making	Networked enterprise	Staff impact
Impact on overall effectiveness of operations	Pearson correlation	1	0.149	0.408*	0.394*
	Sig. (2-tailed)		0.061	0.000	0.000
Decision-making	Pearson correlation	0.149	1	0.000	0.000
	Sig. (2-tailed)	0.61		1.000	1.000
Networked enterprise	Pearson correlation	0.408*	0.000	1	0.000
	Sig. (2-tailed)	0.000	1.000		1.000
Staff impact	Pearson correlation	0.394*	0.000	0.000	1
	Sig. (2-tailed)	0.000	1.000	1.000	

Notes: * Correlation is significant at the 0.01 level (two-tailed)

Table IV.
Impact on overall effectiveness of the organisation

The changes to organisational culture that emerged were seen as having both positive and negative outcomes. The responses reflected different organisational starting points and a differing rate of progress in implementation. But also there were differences in philosophical approach to managing the enterprise from one of the role of systems to bring about greater employee empowerment and autonomy to one of systems being used to tighten procedures and control.

> Generally improved the culture and made it much more informed and knowledgeable (MD of UK graphic design company).

> The culture is such that it doesn't matter how much time you actually spend in the office but how much work you get done (Project director in German pharmaceutical company).

An important dimension identified was the degree to which the culture has changed into one of "sharing" from one of "information is power" in order to capitalise on IT investment. Some reported a more inclusive culture due to the ease of passing information to others.

The ability to respond to changes in the business environment was reflected by a senior commercial manager in an entertainment company.

> The culture is dynamic and fast moving – our business environment changes constantly and the changes are often dramatic. Being able to respond quickly and appropriately and to manage a range of complex business models simultaneously demands flexible thinking and flexible communications tools.

But not all respondents saw the cultural changes so positively:

> The impact is highly positive on operational efficiently and effectiveness; however, electronic communications have a very negative impact on the organisation's culture because people have less opportunity to meet f2f and share direct feelings and exchange respective culture and experiences.

And some saw themselves as being more "under control" in a mechanistic company with an emphasis on the "measurable" at the expense of factors which, in their view, were more likely to impact performance.

But clearly new opportunities have been made possible by the development of ICT for both the organisation and its managers, e.g. "off-shoring", "turn-around times improved", "global working", "reduced travel time".

Turning now to effectiveness in the office and away from it, where managers saw ICT to be leading to improved decision-making effectiveness, this was carried over to effectiveness both when present in the office and away from it (see Table V). The more the managers felt themselves competent in an electronic environment, the more likely they were to report a positive impact on decision-making effectiveness. Additionally, the more managers felt dependent on computer-based systems to perform their role, the less likely they were to report a positive relation to the degree to which the organisation had become networked, although they were more likely to report a feeling of competence, a positive impact on overall effectiveness outside the office and a positive impact on flexibility.

Also, as shown in Table VI, where respondents saw new working practices impacting on their own personal profile, they tended to be positive about its impact on overall effectiveness, both when in the office and when away from it. When the impact

Table V.
Impact of electronic tools (significant relationships based on ANOVA)

		Decision-making	Networked enterprise	Staff impact	Impact on overall effectiveness in the office	Impact on overall effectiveness when away from the office	Feeling of competence in an electronic environment	Dependence on computer-based systems to perform role
Decision-making	Pearson correlation	1	0.000	0.000	0.238**	0.255**	0.173*	0.84
	Sig. (two-tailed)		1.000	1.000	0.003	0.001	0.29	0.295
Networked enterprise	Pearson correlation	0.000	1	0.000	0.166*	−0.077	−0.055	−0.244**
	Sig. (two-tailed)	1.000		1.000	0.37	0.341	0.948	0.002
Staff impact	Pearson correlation	0.000	0.000	1	0.239**	0.179*	−0.047	0.224**
	Sig. (two-tailed)	1.000	1.000		0.003	0.025	0.559	0.005
Impact on overall effectiveness in the office	Pearson correlation	0.238**	0.166*	0.239**	1	0.144	0.060	0.001
	Sig. (two-tailed)	0.003	0.037	0.003		0.59	0.433	0.993
Impact on overall effectiveness when away from the office	Pearson correlation	0.255**	−0.077	0.179*	0.144	1	0.361**	0.212**
	Sig. (two-tailed)	0.001	0.341	0.025	0.059		0.000	0.005
Feeling of competence in an electronic environment	Pearson correlation	0.173*	−0.005	−0.047	0.060	0.361**	1	0.173*
	Sig. (two-tailed)	0.029	0.948	0.559	0.433	0.000		0.23
Dependence on computer-based systems to perform role	Pearson correlation	0.084	−0.244**	0.224**	0.001	0.212**	0.173*	1
	Sig. (two-tailed)	0.295	0.002	0.005	0.993	0.005	0.23	

Notes: * Correlation is significant at the 0.05 level (two-tailed); ** Correlation is significant at the 0.01 level (two-tailed)

		Impact on overall effectiveness in the office	Impact on overall effectiveness when away from the office	Personal relationships	Personal profile	Information work	Impact on overall effectiveness of operations
Impact on overall effectiveness in the office	Pearson correlation	1	0.144	0.218*	0.287*	−0.019	0.344*
	Sig. (two-tailed)		0.059	0.006	0.000	0.818	0.000
Impact on overall effectiveness when away from the office	Pearson correlation	0.144	1	0.90	0.289*	0.125	0.109
	Sig. (two-tailed)	0.059		0.264	0.000	0.120	0.158
Personal relationships	Pearson correlation	0.218*	0.090	1	0.000	0.000	0.224*
	Sig. (two-tailed)	0.006	0.264		1.000	1.000	0.005
Personal profile	Pearson correlation	0.287*	0.289*	0.000	1	0.000	0.96
	Sig. (two-tailed)	0.000	0.000	1.000		1.000	0.233
Information work	Pearson correlation	−0.19	0.125	0.000	0.000	1	0.136
	Sig. (two-tailed)	0.818	0.120	1.000	1.000		0.090
Impact on overall effectiveness of operations	Pearson correlation	0.344*	0.109	0.224*	0.096	0.136	1
	Sig. (two-tailed)	0.000	0.158	0.005	0.233	0.090	

Notes: * Correlation is significant at the 0.01 level (two-tailed)

Table VI.
Impact on own profile and relationships

on relationships was considered strong, it was also seen as impacting on the sense of overall effectiveness but not when working away from the office.

Moreover, Table VII looks at the manager's use of the systems related to a perception of increased overall operational effectiveness, increased management time on contacts (telephone and conference calls). Also these respondents related a positive impact on their own personal effectiveness in the office and their personal relationships to overall operational effectiveness. So this group appeared to be positive about the impact of electronic working on relationship building and effectiveness.

The picture has emerged from the research of a group of strong advocates who were much more networked and dependent upon ICT to perform their role since it requires considerable external working. Others who were strong advocates appeared to be those who were engaged in work, which can benefit from information resources and networks to carry out analytical work effectively. For those whose work was more inwardly focused within the organisation there was no clear relationship between access to systems and perceived personal or organisational operational performance.

As shown in Table VIII, one area which received a high proportion of negative responses related to training programmes in the use of electronic resources: 10 per cent of our respondents reported that, in their view, these programmes were not at all effective, while 39 per cent saw them as not effective. Additionally training in the management of information was seen as ineffective by 65 per cent of our respondents.

Another area seen by many managers as wanting was policies to protect intellectual property (30 per cent reported inadequacy). Moreover, 28 per cent of the respondents felt that their employer's information management policy for computer-based systems was inadequate. Finally, the review of cost/benefits was reported as inadequate by 58 per cent of the managers completing the survey.

This data would suggest that many managers were less than confident about the company's policies and practices in relation to information management. Many of these managers saw themselves as dependent on these services and their organisations moving towards a more networked status with customers and suppliers. But of possibly greater significance was the feeling that training in the use of electronic resources was inadequate. Organisations may be able to leverage their investment in information systems and resources if they improve management utilisation and decision-making.

The under 35 and the 45-54 groups reported a higher impact on decision-making than the 35-44 and over 55 age groups. It might well be that the younger groups were less sceptical than the knowledgeable 35-44 group.

Given the time spent on e-mails and in searching the web, it is interesting to note in Table IX the responses to areas where the potential exists for synchronous communications in a virtual group and for systems to support group decision-making under such circumstances.

Asynchronous working such as e-mails and computer mediated group working suffer from time delays and loss of media richness (Daft and Lengel, 1986) so, in consequence, inadequacies of expression. Video meetings can reduce lapsed time from problem identification to decision as well as allow for clarification of misunderstandings as they occur. But the real impact comes where such sessions generate creative ideas, something generally missing from asynchronous exchanges Birchall and Lyons, 1995).

		Impact on overall effectiveness of operations	Time on conference calls	Time on the phone	Time dealing with e-mails	Frequency of searching internally to support decision-making	Frequency of searching externally to support decision-making	Personal relationships	Networking and contacts	Impact on overall effectiveness in the office	Impact on overall effectiveness when away from the office
Impact on overall effectiveness of operations	Pearson correlation	1	0.251**	0.230**	−0.085	−0.126	0.147	0.252**	0.033	0.344**	0.109
	Sig. (two-tailed)		0.001	0.002	0.268	0.106	0.060	0.001	0.733	0.000	0.158
Time on conference calls	Pearson correlation	0.251**	1	0.231**	−0.012	0.155*	0.055	0.074	0.122	−0.134	0.215**
	Sig. (two-tailed)	0.001		0.002	0.871	0.045	0.479	0.357	0.210	0.080	0.005
Time on the phone	Pearson correlation	0.230**	0.231**	1	0.096	−0.049	−0.005	0.296**	0.179	0.191*	0.123
	Sig. (two-tailed)	0.002	0.002		0.206	0.530	0.944	0.000	0.064	0.012	0.110
Time dealing with e-mails	Pearson correlation	−0.085	−0.012	0.096	1	0.261**	0.095	0.027	0.589**	−0.178*	0.136
	Sig. (two-tailed)	0.268	0.871	0.206		0.001	0.223	0.736	0.000	0.190	0.076
Frequency of searching internally to support decision-making	Pearson correlation	−0.126	0.155*	−0.049	0.261**	1	0.176*	0.132	0.366**	−0.138	0.140
	Sig. (two-tailed)	0.106	0.045	0.530	0.001		0.23	0.103	0.000	0.075	0.074
Frequency of searching externally to support decision-making	Pearson correlation	0.147	0.055	−0.005	0.095	0.176*	1	0.306**	0.350**	0.100	0.071
	Sig. (two-tailed)	0.060	0.479	0.944	0.223	0.023		0.000	0.000	0.198	0.365

(*continued*)

Table VII.
Impact of electronic working on relationship-building and effectiveness

Table VII.

		Impact on overall effectiveness of operations	Time on conference calls	Time on the phone	Time dealing with e-mails	Frequency of searching internally to support decision-making	Frequency of searching externally to support decision-making	Personal relationships	Networking and contacts	Impact on overall effectiveness in the office	Impact on overall effectiveness when away from the office
Personal relationships	Pearson correlation	0.252**	0.74	0.296**	0.27	0.132	0.306**	1	0.354**	0.291**	0.182*
	Sig. (two-tailed)	0.001	0.357	0.000	0.736	0.103	0.000		0.000	0.000	0.021
Networking and contacts	Pearson correlation	0.033	0.122	0.179	0.589**	0.366**	0.350**	0.354**	1	0.064	0.335**
	Sig. (two-tailed)	0.733	0.210	0.64	0.000	0.000	0.000	0.000		0.510	0.000
Impact on overall effectiveness in the office	Pearson correlation	0.344**	−0.134	0.191*	−0.178*	−0.138	0.100	0.291**	0.064	1	0.144
	Sig. (two-tailed)	0.000	0.080	0.012	0.019	0.075	0.198	0.000	0.510		0.059
Impact on overall effectiveness when away from the office	Pearson correlation	0.109	0.215**	0.123	0.136	0.140	0.071	0.182*	0.335**	0.144	1
	Sig. (two-tailed)	0.158	0.005	0.110	0.076	0.074	0.365	0.021	0.000	0.059	

Notes: * Correlation is significant at the 0.05 level (two-tailed); ** Correlation is significant at the 0.01 level (two-tailed)

	Mean (on a 5-point scale: 1 to 5)	Standard deviation
Policies to control use of electronic systems	3.75	1.03
Systems to control unwanted e-mail traffic	4.16	1.03
Training programmes in the use of electronic resources	2.80	1.21
Information security policies	3.83	1.11
Policies to protect intellectual property	3.44	1.34
Back-up in the event of system failure	3.92	1.11
Information management policy for computer-based systems	3.24	1.21
Reviews of cost/benefits of systems in use	2.46	1.35
Training programmes in managing information	2.34	1.26

Table VIII. The effectiveness of the organisation's management of the systems

	Yes (%)	No (%)	Don't know (%)
Availability of videoconferencing facilities	37	62	1
From laptop when working remotely	12	86	2
Specialist information services to support decision-making	42	50	7
Electronic decision-support tools	23	67	10
Electronic knowledge-management systems	50	44	6

Table IX. Access to videoconferencing and decision-support systems

Our respondents recognised that the technology they had access to could be improved and technology-based tools could be used to offer better decision-making support. As one manager put it – "Tools to help get better and more efficiently organised; increased user-friendliness of the systems; improvement in tools and techniques for sharing information, data, etc". And another – "Better applications which aid management decision-making rather than just more applications which create more information but not better decisions".

These issues might be seen as relating to the design of tools and their selection. The system design was a theme taken up by several respondents, one from a systems provider – "It feels that corners are cut, systems introduced with inadequate testing, often unable to cope with the volumes or real user requirements – fortunately we do rather better that this for our customers". And a plea from another – "Simplify, simplify, simplify instead of more-more-more irrelevant non-essentials to raise prices that (in turn) confuse and retard productivity". And another issue around the choices made by those responsible for systems development – "Systems development and choices should be totally based around what you are trying to achieve from a business point of view". "A look at the overall impact of new systems on the organisation, rather than focusing on cost/benefits to the sponsoring group". Certainly there were still issues in organisations around the disparate nature of systems – "harmonizing specific systems and making them more integrative" and "integration of systems and data". And the need for managers to be more involved in defining user requirements – "More conversations around what is needed/wanted and required".

But some saw a move to the greater use of real-time systems as offering potential for effectiveness improvement – "... video conferencing cheaper and easier from each computer". Also the elimination of key-boarding – "better voice recognition software for interacting with management information systems in the office and remotely and most impotent robot assistants". Such tools may free up more management time for what appeared the greatest issue, that of time to build relationships with employees, customers and suppliers.

Conclusions

There was a wide recognition that managers at all levels have a role to play in the successful implementation of ICT and its impact on organisational effectiveness.

ICT has clearly enabled the rapid globalisation of firms and their markets with implications for where work is undertaken and the role and ways of working of managers. But not all respondents were directly impacted.

Working "anytime, anyplace" was possible for many managers in our sample but their access to systems to support them in their job was still limited. Much of their time, however, was spent communicating, whether in meetings, on the phone, or dealing with e-mails. On average considerable time was spent on e-mails, many of which were not important to the job and many of which generate further traffic as clarification has to be sought as to intent.

For some managers electronic work had moved from the office and office routines to intrude into home-life and some felt that this had become an expectation of their colleagues and customers. Nevertheless these managers reported compensatory benefits.

E-mail was clearly essential for those whose role was outward focused – customer facing, dealing with suppliers or working in dispersed teams, particularly when they spend time away from an office base. Another group dependent on the systems were those using the Internet to support analytical work.

In our sample, the extensive use of e-mail for internal transactions was being questioned as a substitute for face-to-face discussion particularly as the lapsed time for decisions can be elongated.

Where firms make good use of ICT to support decision making, networking and to increase flexibility, our respondents reported a positive impact on operational performance. Cultural changes were being experienced both positively (more responsive as a business, information sharing, inclusivity, improved processes, evidence available to support decision-making) and negatively (facelessness, reduced freedom to act, emphasis on protecting one's own position).

Those of our respondents in outward facing roles were positive about ICT's impact on relationship building and in turn personal effectiveness and overall operational effectiveness. They saw plenty of scope to improve the effectiveness of ICT in support of decision-making:

- A greater emphasis on synchronous rather than asynchronous working and the tools to support this.
- Availability of better decision-support tools.
- Access to specialist information services.
- Better systems integration across the business overall.

- Work to identify and develop appropriate organisational cultures.
- Efforts to improve the receptivity and absorptive capacity of the organisation to developments in ICT.
- Training programmes to improve personal effectiveness in information management.

Limitations and further research needs

Based on this exploratory research, a next step could be the development of a model exploring management and organisational performance in terms of the personal characteristics of the manager, the role being performed, the context and the ICT provision. Going on from this model, further research could focus more on differences between management levels and in particular expectations especially among younger managers. This could then start to question the impact of differences on the future management of enterprises. If there is a substantial and growing divergence will this impact on the commitment of more ICT competent junior staff unless changes take place in the nature of decision-making, e.g. more transparency and evidence-based. Also in an extended survey differences may be more apparent due to cultural context, if so can these be explained by differences in national ICT literacy and competence? This would have implications for policy-makers. But at the end of the day one question to be more fully explored is the impact of managers on the adoption of ICT and its ultimate impact on organisational performance.

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