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Current Challenges Facing Information and Communications Technology: A Manifesto For Change

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Conference Foreword

Dear Delegate,

The Transforming Information and Learning Conference 2008 has seen a small number of papers, but a corresponding increase in quality of submissions. The authors represent a cross-section of perspectives that include International and Australian viewpoints.

All published papers were double blind peer-reviewed before acceptance into the conference for publication. There were a total of 10 papers submitted for review from which 9 were accepted and presented.

The Transforming Information and Learning Conference 2008 sought to facilitate discussion of the ways in which individuals, groups, technologies and spaces may interact to transform teaching, information delivery, learning and social networks. Under the theme of "Transformers: people, technologies and spaces", the conference focused on three main areas of discussion:

- People as transformers.
- The transformative effects of technologies.
- Spaces for transformative interaction.

The conference took a great deal of co-ordination, time and effort. I express my thanks to the conference organisers for their hard work and dedication to the conference cause. In particular, the conference committee commends the various reviewers, editors and proposal submitters for their devotion and perseverance in the face of countless other duties and engagements. In concert with this gratitude is a vote of thanks to the conference chair Judy Clayden and program coordinator Leisa Armstrong for their work in overseeing the conference.

Sincerely,

David Cook
Conference Proceedings Editor

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Current challenges facing Information and Communications Technology: A manifesto for change

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ABSTRACT

A distinction is drawn concerning the true nature of Information and Communications Technology (ICT) which previously was seen as technology-focused or techno centric but actually concerns transformation and the management of change in business (socio-techno centric). Current issues and challenges in ICT are examined and future trends and directions highlighted. This leads to a manifesto for change outlining a coherent approach to transforming ICT into a resource which fully contributes to business. Finally given this manifesto, challenges for tertiary education are outlined.

INTRODUCTION

This paper will firstly examine selected ICT industry trends to identify factors that have affected and will continue to affect our ability to transform business. It then considers how the ICT industry as a profession responded to the massive uptake of information technology in business. It then presents a manifesto for change and focus in the ICT industry. That manifesto itemizes specific areas that will have to be addressed if ICT is to provide the benefits to business it is clearly technologically able to and thus achieve its potential for transformation. Finally it discusses the implications for the education of ICT professionals and business managers.

ICT industry trends

One thing is quite clear and that is new information technologies will continue to appear as products in the marketplace. There is indeed no end in sight and no sign that this will slow down. Indeed the opposite is more likely as technology companies such as Microsoft and Intel compete ever more fiercely for market share and profit.

Recent trends include the era of wireless, mobile, ubiquitous, secure computing (Gartner 2004). What we are seeing is a shift from the physical to the virtual in the following sense. Previously the human went to the machine. Machines were not moveable and so humankind obliged by going to them physically. With the availability of wireless and mobile technologies that has become far less necessary and of course this fits very well with business need. Managers and sales personnel on the road need access to information where and when they want it. This

business imperative will lead to more ubiquity of services. For example, today we are seeing wireless hotspots in cafes, airports, universities and CBDs and of course with competition the costs for these will come down. Increased interest in security is a by-product of mobility and ubiquity. For example, today a PDA/mobile phone left on a train (or hacked into) could conceivably contain mission critical information about a company which in the hands of competitors would be highly valuable. That particular risk didn't exist previously.

Another long term trend has been in the maturing of ICT as a 'business' in its own right. Examples of this include proliferation of ICT services and ICT outsourcing. Behind this trend is the recognition that the market for ICT is huge, that it requires specialist skills and that therefore there is a market for specialist companies to supply services that align with business needs and that allow the company to concentrate on its core business thus leaving ICT or parts of it to the so called experts.

The cost of ICT is a fascinating area in its own right. Hardware costs continue to fall and the famous Moore's Law is expected to hold for possibly the next 20 years (Dubash 2007). Also the cost of many software products is falling though not as quickly (Frye 2007). This is partly because the software acquisition component in in house development is relatively expensive compared to the cost of packages and products such as Microsoft Office (a relatively small acquisition cost).

Having said that cost of system development is still rising because of increasing complexity and substantial people costs. Today, most ICT literate organisations have already developed the simple standalone systems such as payrolls. Much more focus now is on enterprise wide systems that involve integration of data across many departments if not the whole organisation. Such systems are notoriously much harder and riskier and so more costly. Further, people with good experience in these enterprise wide systems are often hard to find and so companies will pay a premium for people with the right experience. A related discovery with maturing accounting practices such as total cost of ownership is that hidden costs such as users' time involvement were previously not being included in the costing of a system.

Job and employment trends have also changed the face of the ICT industry. Globalisation is a major shift as is virtual team development. Many multinationals and even nationals undertake development in virtual teams. While this leads to communication challenges it permits these companies to develop systems round the clock rather than for just eight hours per day by taking account of the working day in different parts of the world. This allows companies to develop at nearly three times the speed as well as take advantage of lower labour rates in certain parts of the world. No discussion of employment trends would be complete with noting the offshore outsourcing trend especially to countries such as India and the Philippines. While most of us have heard of call centres being relocated to these countries, this is only part of the phenomenon. In India today for example, there is enormous skilled talent in software development in areas around Bangalore and Hyderabad. While labour costs there are still cheaper, they are catching up with the west and so it will be interesting to see how narrower margins will affect outsourcing to India in the future.

The ICT industry's relationship with business

The ICT industry has had a chequered history of failures and successes. Project failure rates of up to 80% of all projects are commonly bandied in the literature (The Standish Group 2003). Because of such experiences of failure over a sustained period of time, ICT is often viewed cynically by the rest of the business. When ICT was relatively new in organisations, the ICT department was given the space to determine what was needed. In those early days the ICT profession probably saw itself as essentially technical in nature and so delivered systems were often narrow in outlook and naïve about context. Because this proved inadequate, business's reaction was typically to bicker about the detail, demand better quality and 'blame' ICT for the failure. ICT's response to this was to invest heavily in documentation, methodology and sign offs as a way of defending that they provided 'what the users said they wanted'. Of course the real problem here was that neither side understood that the essential nature of ICT in business is socio-techno centric, that is a technical discipline embedded in an organisational context and so must address organisation, social and political factors to be effective. And so having misunderstood this, relationships between ICT and the rest of the organisation often deteriorated to a point where the rest of the organisation would appoint a project manager from outside ICT to run the project or worse still employ outside consultants or software houses thereby avoiding the internal ICT department altogether.

Now perhaps the above paints a rather harsh picture of ICT's relationship with business and perhaps too things have moved on somewhat but even today, it is not uncommon for business to keep a tight rein over its ICT department, not involve ICT in strategic decision making and thus viewing the profession as essentially techno-centric only bringing them in at implementation to get on with the job. Of course an important negative side effect of this phenomenon is that ICT is denied the opportunity to contribute at a strategic level and offer innovative ideas that could help the business to be more competitive.

A manifesto for transformation

Clearly there needs to be a shift in perception that ICT is a socio-technical management discipline requiring appropriate social skill sets, training and a business orientation in addition to its technological background. That shift in outlook is probably required more so from the rest of the business. Having said that the ICT industry still has some issues to attend to. For example, most computer students are still attracted to ICT because of the (false) perception that it is a technical discipline and so we seem to self select people with at least the wrong outlook if not weak in the innate people skills required by the profession.

But the real challenge is how to transform the relationship between ICT and business. Here it is critical that emphasis is put on maturing the relationship; to move organisations from the current stand off in which there is little respect or mutual trust and here the ICT industry must take the lead in initiating this. The following is a set of initiatives that taken together constitute a coherent manifesto for transformation.

The ICT department should initiate a discussion in their organisation about governance and particularly ICT governance. Some organisations have already done this with significant success (Horsley 2004). The importance of this as an opening gambit should not be underestimated because it goes to some of the root of some of the basic inequities discussed above. Out of this discussion should come at least a recognition that the current relationship with ICT (for example the role and level that ICT plays within an organisation) may be inhibiting the business. Useful resources (for example toolkits and implementation guides) on ICT governance and a forum can be found at ITGI (2007).

The second initiative is to set about managing ICT as a portfolio of projects. This is important because ICT needs to be seen by the rest of the organisation to be acting as a business and relate to the rest of the organisation in ways with which the business is familiar and comfortable. Figure 1 shows a portfolio for projects for an organisation. The payroll and accounting systems are classified as industry standard and relatively general i.e. not specific to a particular industry. For many organisations such systems are not strategic and so they are happy to use relatively cheap packages. On the other hand the business intelligence system and the ERP system are strategic for this company and so more effort and focus needs to be placed on these projects. Using this matrix as a tool for discussion with senior management, decisions such as whether to outsource a project, whether to buy in a packages as opposed to develop in house can be viewed within a strategic context and so better informed decisions taken. And of course using such tools with senior management reinforces the view that ICT can contribute in important strategic conversations within the organisation.

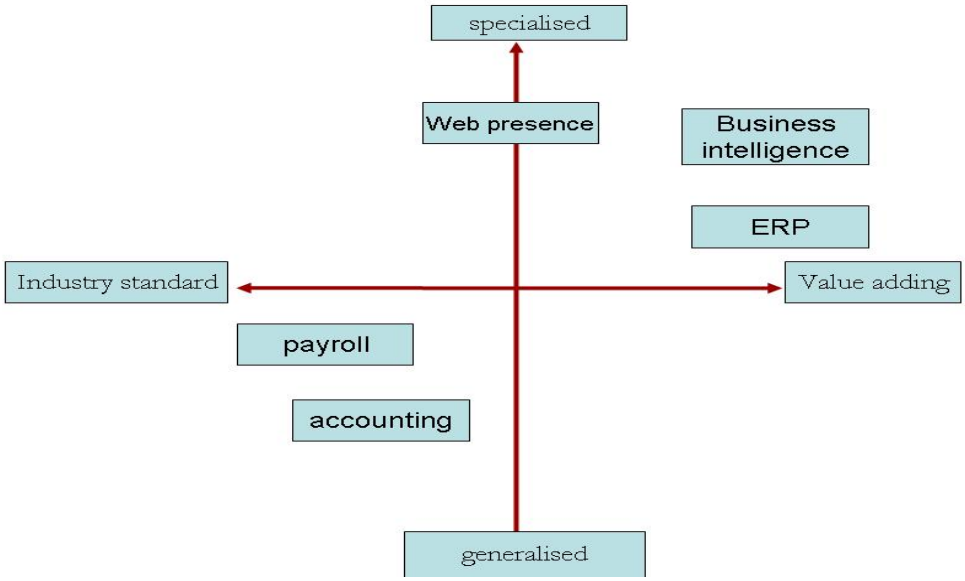

Figure 1: A Portfolio of Projects (adapted from Quick, 2005)

Thirdly there is a need for senior management in the organisation to embrace benefits realisation. Benefits realisation is a process in which organisations active seek to manage and monitor how benefits are realised from ICT projects. There are many examples of ICT benefits realisation methods including the DMR Benefits Realisation Approach (Truax 1997), the Cranfield Model of Benefits Management (Ward et al. 1996) and the Active Benefit Realisation approach (Remenyi and Sherwood-Smith 1998). Interestingly a consequence of this is that business end will need to get up to speed with their obligations in achieving benefits. For too long the responsibility has been with ICT to demonstrate that benefits have been achieved when in fact ICT is really only responsible for the delivery of the software and hardware. It is the business end that needs to be ultimately responsible for achieving benefits (Lin 2002).

Along with a benefits realisation approach, an ICT balanced score card should be introduced. A balanced scorecard identifies areas for evaluation and measurement of service provision. Van Grembergen (2007) takes this one step further by identifying four key areas relevant to assessing ICT. These areas are user orientation, business contribution, operational excellence and future orientation. Clearly these criteria are far more focused on the business and so, since they involve evaluation by senior management from the rest of the organisation, serve to re-inforce the change in focus of ICT and its management.

Maturity models are another important component of the discussion and growing relationship with the rest of the business. Figure 2 shows an example of the Capability Maturity Model (CMM) for Software. While the CMM is a blueprint for the ICT department to measure itself against, it also a tool for engaging the rest of the organisation. The rest of the organisation understands the cost of documentation, the cost of applying standards, the cost of backup and succession planning and the like and because the CMM is framed in these concepts that ICT will gain acceptance from the rest of the organisation of a business like approach to its operations.

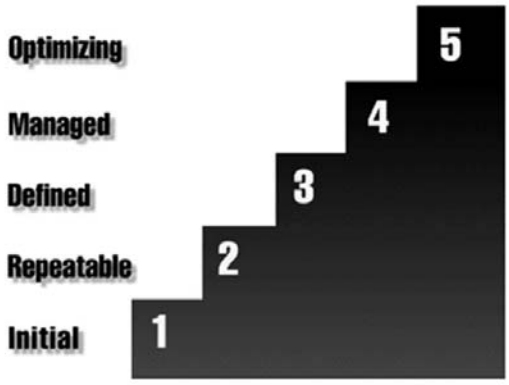

Figure 2: The Capability Maturity Model for Software (Paulk et al., 1993)

Lastly an important cornerstone of ICT's business oriented commitment to an organisation is framed in service management philosophy and ITIL is arguably the best manifestation of that approach (ITIL 2007). ITIL is part of a suite of best practices recommended for use by the UK government (OGC 2007). Others include a project management method and risk assessment approach. ITIL is a resource for organisations wishing to shift from a project orientation to a true service provider underpinning strategy and business processes. ITIL is a set of practices that supports treating what ICT provides as services to the rest of the organisation. For example there are guidelines on help desk service, problem management, configuration management, continuity planning and disaster recovery. At the heart of ITIL is the service level agreement (SLA) which specifies the obligations of each party. The SLA is negotiated with the rest of the organisation and the details are transparent. Again the important feature of the SLA and ITIL is that they structure the attitude of the rest of the organisation, they raise and build expectations, they provide a common vocabulary that is in business terms through which ICT and users can communicate. As such ITIL underpins and supports ICT governance in organisations.

Challenges facing the Tertiary Sector

Clearly there are two facets to this; there is the shift in emphasis to socio-technical education that is required for ICT students and there is the orientation required to prepare future business managers to exploit ICT opportunities and work with ICT professionals. Neither of these have been addressed satisfactorily so far.

As regards the education of ICT professionals, course design needs to include significant components covering the content discussed above. For most ICT courses this is a major shift from what is currently taught. At undergraduate level there still needs to be a sufficient focus on competency in basic ICT skill sets because that is what employers will continue to use them for initially after graduation. Perhaps the biggest challenge here will be to attract 'business naive' school leavers who see working with computers as a way of opting out of interacting with humans! The picture is less problematic at postgraduate level where is is far more acceptance of the need to produce masters graduate who are socio-technical centric. For example ECU runs a masters in Computer Consultancy.

Generally speaking there is a critical mass of academics teaching ICT who at least understand this need, but outside ICT in the general sphere of business and management teaching it is contended that there is much less awareness of this need for change. Many business focused academics still consider ICT as a technical discipline concerning mostly the teaching of spreadsheets and word processing, which is a far cry from benefits realisation, service management and generally seeing the need to work strategically with ICT professionals. It therefore behove the ICT academic to engage their business peers in deep and meaningful discussions.

SUMMARY

It's clear that for ICT to effectively contribute to business that a lot of change is still required in many areas. The place to start is with relationships and to start to build up mutual trust on both sides. The current cynical perception of ICT by business is not a productive starting point. That said, more is needed than merely a recognition of the need to build relationships. Real growth in trust will only come about when ICT can demonstrate good process that is well documented and transparent. So it is fundamental that a set of initiatives such as the ones above are put in place that back up that commitment to growing trust and mutual respect. These initiatives need to be coherent and cover the range of activity that is the domain of ICT in modern organisations. Only then should ICT aspire to its rightful place at the director's table.

The potential role of the educators of ICT students should not be underestimated. The time is right for ICT to lay claim to its place in business by properly preparing the professionals of the future and by engaging their business colleagues on ICT's true role.

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