The Future of IT Management: A Longitudinal Qualitative Review

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1. Summary

This paper is a sequel to the 2015 paper "EUNIS Congress' 21st Birthday: A Historical Perspective on its Proceedings". Its focus is on IT management activities as interpreted from information available in the "EUNIS Proceedings repository". Papers on non-technical aspects of IT management are a small percentage of those presented over the Congress' 21 year history; they fall under several tracks, however by "drilling down" into abstracts and keywords an indication of "hot topics" is possible.

IT management foci have seen paradigm shifts from emphasis on operational and service management through customer relations and strategic management, then governance and 'top table' participation. Technological advances are impacting significantly upon society, with the pace of change being rampant. With the socialization of IT and the personalization of "smart" devices are we confronting a future where current IT management emphasis needs to change in terms of an ability to keep pace with an agile environment? What skills are necessary if IT leadership is to be in tune with institutional requirements and capable of delivery so as to maintain competitive advantages? Is the successive reliance on conventional management practices agile enough in the present time? Are we at a crossroads where present management emphasis is at variance with a need to be an innovative leader identifying and devising technology-rich environments that are abreast of our student generation? Some challenges and approaches to them are outlined in response to these questions, calling upon research elsewhere in the Higher Education (HE) sector and in business literature.

2. IT MANAGEMENT: HISTORICAL CONTEXT

IT managerial skills and experiences have changed considerably since the early establishment of centralized computer departments, say, from the late 1950s onwards. "Early days" managerial competencies focused on "running hardware" with little attention given to users, apart from researchers and their compute requirements. Considering this era as "first generation management"; the emphasis was on technical and operational knowledge and experience where the management function often resided with persons whose experience was gained through direct use of the technology. Over the past 50 years a transition from a technical specialist to board-level strategist has evolved.

As the application of computing diversified to encompass non-scientific and non-engineering disciplines the need to recognize support requirements arose. Also, administrative computing began to develop, often as a separate organizational unit. The emergence of early organizational structures included a "user support" function sitting alongside, typically, a "systems" and "operations" function, however managerial oversight remained predominately a technical responsibility.

In the 1970s, as organizational structures developed those who held responsibility for functional areas became eligible for promotion to managerial positions. Concurrently, user bases were expanding with undergraduates now using computers and the presence of mini and microcomputers bringing about a broader spectrum of support services. The transition from a technical specialist manager towards an appreciation of wider service needs began. Their departmental subordinates were the "technical brains" who helped steer technical and operational needs. Relationships with peers in finance and staffing completed the portfolio of senior managerial requirements commensurate with the era.

With the 1980s came further managerial developments, including mergers of library and IT departments as information in digital formats became de rigueur. In a number of UK institutions the merged department came under the leadership of persons with a librarianship background, indicating transition towards user centric strategic developments. Moving to the next decade, the ubiquity of IT was evident with major changes in the types of applications used in the academic world, demands for new management information systems to support the academic function, personal devices routinely used by students and digital networking pushing physical boundaries for IT use. Then, IT management became a boardroom level function due to its criticality to institutional competitiveness, as management information systems became the life blood of the business. Consultancy assignments replaced or complemented major in-house developments as a way of injecting new thinking and new knowledge into projects, perhaps indicating a more "open" approach to human resource provision.

The new millennium heralded further changes with many novel applications being harnessed, especially by the Y-Generation who were now in tertiary education as technically savvy Information Age students. The habitual use of social media, mobile devices and an ever increasing range of relevant freeware served to further delineate what should, and should not, be the strategic direction of centralized departments. As the millennium progresses so has the constraints on budgets due to the economic downturn and the increasing dependency on IT to support the institution's business. Availability of commercial software and consultancy services alongside the ever-evolving "in the cloud computing" opportunities are impacting the HE sector as institutions seek to keep pace with information requirements. Can internal human resources and the corresponding knowledge base alone sustain the needs of a progressive tertiary education sector? Emerging technologies is a buzz phrase that succinctly encapsulates the paradigm within which IT seems to now be permanently seated. On the other hand, and against strong external pressures, the sector is confronting flexibility and sustainability issues as a constant demand. What can be achieved? Today emphasis is focused more towards strategic and leadership matters than technology; the capability to deliver business value using technological platforms with lowest 'total cost of ownership' is a greater challenge than an exclusively technological one. The continuing decline of government funding, especially in the UK but also elsewhere, coupled with increased competitiveness and the constant need for information services see the Chief Information Officer's (CIO's) roles extend far beyond the technology; they contribute to a vision for institutional change and act as a catalyst to bring about these changes.

3. MANAGERIAL CHALLENGES

Myriad phrases populate the literature when the pace of change in IT is discussed. Today's business emphasis focuses on information and data including analytics, privacy and security aspects and "the cloud" with its many ramifications for how IT is provided and managed. The proliferation of mobile devices pushes the "technology everywhere" agenda whether for staff or students. Mobility is but one dimension of the "internet of things", with cloud computing presenting opportunities not even conceived a few years previously. These technologies are the tip of an emerging technologies iceberg. Looking at the UK's UCISA "Strategic Challenges for IT Services" report (2013) we note that effective governance, choice of appropriate delivery model, use of consultancy, process improvement and 'corporate data issues' inhibiting value optimization from Business Intelligence applications are some of the key challenges. Educause's 2016 "Top 10" list (2016) promotes "divest, reinvest and differentiate" as key themes; *divest* from what can be provided by others, *reinvest* in the workforce skills and structures and *differentiate* by adopting technologies, processes and services that align with the institution's most strategic priorities.

Agility within a leadership context seems to balance with emerging technologies within an IT business support context. To achieve flexibility, sustainability and a competitive edge mandates a sound and agile leadership culture. An ability to keep abreast of new developments affords the opportunity to examine their relevance and business worth to a progressive institution. An important question is "What level of technical knowledge is appropriate to appraise new developments and their suitability for addressing aspects of an IT Strategic Plan and how best can this knowledge be achieved?" With the prevalence of emphasis on management performance, whether using Balanced Scorecards, Key Performance Metrics or Service Agreements, the need to take "right" and "timely" decisions is critical.

The senior IT manager, along with their departmental team, is a critical link in the university's overall decision making process. This collective resource needs to focus on a common goal; their capability

to ‘add value to the business.’ Restructuring of organizational units is common, especially in UK universities, though perhaps predicated by a requirement to reduce operational costs rather than as a method of strategic realignment of skill sets. For example, customer focused developments whilst necessitating sound technical domain knowledge also mandates a persona with capability of building and maintaining successful human-human relationships. ‘Back of organization’ specialist teams may not possess the social and technical skills to be members of a ‘front of organization’ team. Similarly, retraining and the pace of retraining necessary to keep pace with the contemporary technological world, is predicated on an aspiration to interact widely and to possess a positive attitude towards ‘learning from others’, with less effort directed towards ‘learning by doing’. A recent Deloitte report on “Higher Education is Evolving” (2011) discusses the roles of the CIO within Canadian Universities, stating that “Higher education CIOs today often see themselves engaged in campus-wide discussions and decisions that have little to do with technology.” This assertion is likely to adequately describe the European as well as the US situation. For example, EDUCAUSE’s article by Berman et al (2014) on “Challenge Accepted! Why CIO Is the Best Job on Campus” cites several CIOs roles, many indirectly technology-related and many others at the very heart of institution’s vision and strategy.

4. A REVIEW OF EUNIS CONGRESS PRESENTATIONS

A qualitative review of Congress contributions associated with non-technical managerial level issues is challenging given the nature of information available. In general terms, Eunis Congresses tend to focus on technical matters and in its formative years there were several contributions from within the research community. Even today technical contributions continue to feature heavily, including several that are presented under a leadership theme given their “pushing new approaches and technologies” nature. Whilst technical leadership is acknowledged, nevertheless the focus is upon the higher tiers of leadership; those involved in the wider horizon gazing and actively contributing to how the overall institution is being positioned within the higher education arena.

Using track titles and undertaking amalgamations where there are similarities across years, for example tracks where “leadership” or “strategy” is in the track title are combined into a generic “leadership” or “strategy” title respectively, the distribution of what may be perceived as “C-suite” presentations is as shown in Table 1. The total of these presentations represents approximately 35% of all Congress presentations over the past 21 years. Examining when particular tracks were introduced provides some indication of when a topic became important. For example “changing roles of computer centres” featured in years 1997 and 1998 whereas “IT Governance” didn’t feature until 2004, “leadership” and “strategy” in 2005 and “new challenges” in 2010.

Table 1: Generic Track Titles

Generic Track Titles	Count
IT Strategy	84
IT Leadership	77
IT Governance	119
IT Management	61
Changing Roles/Structures/Challenges	64

An examination of paper titles, abstracts (where available) and tracks provides a generalized synopsis of management-related issues. In line with the paper’s title, effort has been made to identify contributions that evidence an evolution of the role played by centralized IT departments.

As early as 1997, in the UK, Information Strategies (IS) were becoming topical; also in the USA the relevance of environmental screening to strategic planning highlighted the pace of change within the HE sector. Rothery and Hughes (1997) in discussing IS conclude that the role of central IT/Computing Services whilst not central to the Information Strategy process, is essential in implementing IT developments contained within it, thus reinforcing the department’s institutional commitment. The authors reinforce the importance of an IS as opposed to the technology, highlighting a significant departure in how computing/IT is viewed. The era brought about a new emphasis, one of wider institutional needs not only technology per se. Central IT departmental leadership needed to grasp that subsidiary or subservient nature of an IT Strategy to the Information Strategy; their capacity to function strategically as opposed to technologically and managerially became more centre stage. Foster (1997), in discussing environmental screening, advised that “technology is no longer the limiting factor. Now, more often than not, institutional culture and practice are the inhibitors or catalysts for change”. Her remarks indicate a transition of emphasis towards “the greater good of the institution.”

Reid (1998) provides insight to changing roles of central IT departments. He mentions strategy- and policy-related roles. Strong indications of mergers with libraries and the need to more closely IT align with the core business of the university are articulated. His work highlights matters requiring leaders who could identify with trends and who had the ability to operate at board level in the interest of ensuring the salient aspects of their organizational units were understood and protected.

In 1999 Congress's focus turned towards technological innovations. Whilst "IT Strategy" and inter-university collaboration featured nevertheless these presentations adopted a stance around technologies. The topic of "University Management" featured in 2000 though presentations focused on technologies including knowledge management and national networking initiatives. Similarly in 2001, the tracks "Changes in University Organisation and Structure" gave consideration to technology, for example the use of the internet to support "anytime-anywhere support services". This was the only topic that clearly provided opportunity for strategic leadership contributions. The 2002 event's programme continued with themes broadly aligned to those in the preceding three years though Law's (2002) keynote presentation on "Planning and designing IS for university management" provided that higher level of non-technical leadership focus. Furthermore, as a keynote presentation, it reinforced the continuance of importance of IS's from their emergence some five years earlier. Amsterdam's Congress, in 2003, heavily featured the "e-topics" (e-Learning, e-University and e-Science), with the Gartner keynote presentation on "Higher Education: the state of the technology". The first decade of Eunis Congresses concluded with the 2004 Congress theme of "IT Innovation in a Changing World". The tracks addressed continued to feature aspects of transactional leadership with grid computing, various applications of commercial products to "e-scenarios" and IT governance much to the fore.

By 2005, tracks included "Strategy" and "Governance and Leadership" headings alongside technology-related topics including middleware, e-learning and information systems. 2006 continued with "Strategy" and the introduction of a session on "Leadership: Effective Management" complemented by tracks comparable to the immediate past Congresses. Regrettably abstracts are unavailable to ascertain the nature of paper contributions though paper titles indicate discussions around leadership and IS developments, the role of IT in shaping an organization, customer focus and leading and managing. Apart from a track incorporating "IT governance and strategy" the 2007 Congress track list returned its attention to technologies including implications associated with mobile device use, IT support for the Bologna process, identity management and security and "e-themes". 2007's keynote address, by Zastrocky, titled "IT leadership and the Role of the CIO" identified the upcoming shortage of IT leaders and the role and requirement for Chief Information Officers (CIOs). His research on CIO roles reinforces a 21stC requirement for these persons to be "full spectrum" contributors to the organization's most senior executive team (Zastrocky, 2000). In 2008 three tracks featured "management", namely "managing processes", "Managing IT projects" and "Managing IT Infrastructure and Data Centres". Based on the associated abstracts, each paper focused on what may be considered to incorporate elements of organizational leadership; leadership incorporating strategy execution and the facilitation of change based around adoption of new technologies and new processes. For example data centre virtualization, standards adoption e.g. associated with ITIL ® and COBIT ®, podcasting and various software technologies were discussed. Moving to 2009, technologies, identity management, e-learning, security and web-based solutions dominated, with "IT Governance" the only observed track providing a strategic and potentially pan-national approach to governance (Fernández and Llorens, 2009). A similar suite of tracks featured in 2010, with the introduction of a "New Challenges" track serving to capture papers discussing the potential value of specific technologies to learning, teaching and administration. The 2012 Congress saw "Leadership" return to the track list where associated contributions focused on the academic realms of the university. Moving to 2013, "Leadership and Governance" was a track within which benchmarking, departmental reorganization and approaches to IT governance based around the ISO Standard featured. The role of Chief Information Officers (CIOs) first featured in a track title; "CIO and IT Management", in 2014. The associated papers, similar to in 2012, featured technologies (e.g. Microsoft Lync and cloud computing) apart from Wilson's (2014) where changes within HE and Institution's IT demands impacted upon central IT department's roles and organizational structures. Last year's Congress (2015) featured a track titled "Leadership, Management and Governance (Surveys)." Hotzel et al (2015) provided an interesting survey of CIO types within the German University sector; other papers within the track focused on technologies with enterprise architecture, based around COBIT, being used to assess the value that IT adds to an institution (Westerlund, 2015).

The synopsis illustrates the substantial variability perceived to exist across the history of the Congress, yet where presentations indicative of "C-suite" matters arise it is interesting to note the ebb and flow of key issues. Changing roles and structures within IT departments featured from 1997 to 2001; IT governance was evident during the period 2004 to 2009; IT strategy during 2005 to 2012 and IT Leadership from 2005 through to 2015. Whilst each track did not feature in each year of the time intervals nevertheless an indication of the prevalence of the topic is acquired.

5. WHAT IS THE FUTURE FOR LEADERSHIP AND MANAGEMENT?

Positions that fall within the "C-suite" classification, such as the CIO or "IT leader", vary in their responsibility portfolios and some smaller institutions may not incorporate the word "chief" in senior IT titles. Hopkins and Clarke (2013) provided a thought-provoking glimpse at how institutional IT roles could change, quoting Jon Madonna, "Nothing stops an organization faster than people who believe that the way you worked yesterday is the best way to work tomorrow." The emphasis on changes of skills and competencies is strongly stated. In 2014, Eriksson focused on managerial attributes relevant in today's agile world. Both contributions touch upon technological, political, financial and social changes as they influence the environment within which the successful IT leader operates. Moving forward over the next few years it is likely to be the case that "change will be a constant" whether technologically or otherwise. Quoting, from George Orwell, "If people cannot write well, they cannot think well, and if they cannot think well, others will do their thinking for them", the latter part of his expression ably sums up the criticality of effectiveness for leaders and managers. However, can we expect a university to recruit, retain and develop the portfolio of skills necessary to keep ahead of the changes it faces? "Probably not" for many institutions however a culture of acceptance of consultancy, reports from trusted community sources (e.g. Educause, EUNIS, and UCISA) and networking/partnering with fellow institutions may help alleviate the skills and workforce pain.

Considering the initial question "Are we confronting a future where past and current management emphasis needs to change?" indications are that the answer is "Yes" and that change does take place, whether through restructuring, role changes or approaches to service provisioning. For example, the maturity of modern ubiquitous technologies, the socialization of IT and the personalization of "smart" devices serve to demystify the technical aspects with resulting changes in demand on support services. The management of the IT support function is on a transition towards customer service, quality and performance management, and "any-time any-where" access. Strategic opportunities to avail of off-campus support from providers such as NorMAN and UniDesk are outsourcing options. In the UK the Joint Information Systems Committee (JISC) provides a contemporary and comprehensive portfolio of services to support institutions, whether by analyzing IT expenditures, providing access to a shared data service framework or producing a comprehensive suite of "state of the art" reports across a range of issues relevant to technology and its implications for teaching and learning, research and administration. The "X as a Service" (XaaS) model, of which the preceding examples are part, is sufficiently mature to become an alternative to in-house provision. The capacity to evaluate, select, implement and then successfully manage XaaS developments mandates expertise such as contract management, relationship management and negotiation. Whilst these skills are not a new requirement, nevertheless they are likely to be the skillset of key persons if an institution pursues the displacement, for example, of aspects of data centre services with an "IT as a Service" (ITaaS) provider. An appetite for retraining may be needed. Change is inevitable within management practices; no longer is it timely, economic or strategic to expect to have oversight of key business needs and concurrently devise and implement bespoke solutions. The future of effective management resides in the territories of collaboration, business partnerships and the effective transformation of staff skills and aspirations towards enhanced social networking, greater acceptance of solutions already proven elsewhere and the internal dissolving of technical organizational barriers. The preceding comments relate to "within organizational unit" strategic matters however the leadership role to evolve change must be in tune with "board level" requirements and be capable of delivering change within their scope where the action underpins competitive advantages for their institution. Conventionally the identification of managerial and leadership skills has been based on theoretical models of the "quadrant type" or "personality trait assessment tools". These approaches compartmentalize persons based on perceived strengths however agile environments may blur boundaries to mandate greater levels of risk taking, greater flexibility in terms of roles, responsibilities and decision making and more frequently dealing with business and technological issues that are

beyond one's "comfort zone" of knowledge and experience. Transformational leaders are needed in an agile environment, those with a vision, a capability to inspire others and to contribute to cultural change. Findings of the Educause report "Todays Higher Education IT Workforce" (2014) are pertinent regarding non-technical skills and appetites to reskill for "non-managerial" staff.

Regarding the question concerning "level of technical knowledge appropriate to appraise new developments and their suitability for addressing aspects of an IT Strategic Plan", the answer should have cognizance of what aspects will be in-house and necessitate local business intelligence, for example those associated with information management and business intelligence. Analytical skills coupled with a capability to effectively interact with other senior business unit staff are required.

Keeping pace in an agile environment encompasses government policy, the institution's student catchment and the execution of the university's mission statement. IT leadership that demonstrates acuity in this wider context, a strong track record of 'horizon scanning', the ability to identify need for change and execute change, adapting aspects of the business to achieve "best fit" with other changes and the authority, and respect of board-level personnel, to identify IT projects to achieve and maintain competitiveness are necessary "C-suite" capabilities. An Accenture report "Traits of a Truly Agile Business" (2014) states a comparable set of competencies for the continued success of large multi-national business organizations, based on its survey of "C-suite" executives. Hayes, in her JISC blog (2014), reinforces the need to "develop the skills in our current, and likely future CIOs, to keep pace with the ever-changing landscape and organizational expectations for IT." For an institution to maintain competitive advantage the skills and experience of the CIO must be incorporated within executive decision making; as an effective communicator and collaborator, the CIO, will ensure the viability of IT solutions to business needs and identify how IT can effect transformations.

Traditional managerial practices and scope of influence have changed and are likely to continue to change as the environment within which the "C-suite" IT executive performs. "Knowledge of IT" is less important than "knowledge about IT and its capabilities"; an appetite for change in a broad sense is essential since the prominence of IT management, or leadership, has gradually risen through institutional hierarchies, reaching to the highest tier of management.

6. CONCLUDING COMMENTS AND OBSERVATIONS

Weaknesses and limitations exist in this survey and the opportunity to draw specific conclusions is limited. For example, the type of information available is inconsistent across the review period; in some instances only the Congress Programme is available and in other instances there is access to Abstracts. It must be recognized that the observations made are based on those universities whose staff have contributed to EUNIS Congresses; they may be unrepresentative of the wider European University sector. Furthermore, senior management positions are likely to assume various portfolios of responsibility dependent upon, for example, the size of the organization, its type (e.g. principally research focused, mainly undergraduate taught courses etc.), the range of disciplines covered (e.g. liberal arts, technological, business or hosting a medical faculty) and the primary funding source (e.g. government, private, research or hybrid funding models). Todd, in her doctoral thesis "Leadership in Higher Education: The CIO Role and the Leadership Team" (2011) provides a comprehensive review of responsibility and role differences associated with CIOs drawn from "mid-size 4-year private US Colleges". Her work helps to substantiate the need to be attentive to "influencing variables" when seeking to state generalizations. The choice of keywords and the positioning of papers within tracks is open to interpretation; track titles vary across years with papers with similar focus appearing under tracks with dissimilar titles. The eclectic mix of factors involved in the study coupled with the authors' interpretations are critical and must be considered in any observations made.

Generally speaking, the principal thrust of Congress presentations as measured by frequency of occurrence of track titles, is that of "technology as an enabler" whether for information management, teaching and learning, research or other administrative purposes. The associated leadership, or management, roles are varied with several corresponding to "C-suite" activities; those that enable strategic decisions, those that reside at the centre of an organization's business direction and those that streamline and add value to processes. Positions in the HE sector and similar positions in the public sector have many "soft" skills and roles parallels, as evidenced from the literature referenced elsewhere, however there are also several characteristic differences between, for example, income sources, impact of government policies and outputs.

Given the significance of IT "C-suite" roles within universities it is timely to consider an initiative whereby the European HE community could be surveyed, examining opportunities to collaborate in identifying developmental opportunities for the future "CIO" within EU HE institutions. EDUCAUSE's work in education and development programmes is acknowledged and made readily accessible to the Eunis community. The work of Leslie and van Velsor (1998) may highlight factors of contemporary relevance, for example in the areas of cultural heterogeneity and cross-national team working factors. Co-operation from within the Coalition of Higher Education Information Technology Associations (CHEITA) would be distinctly advantageous in facilitating American and Australasia involvement.

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