Wednesday 15th June 2011

Time: 12:30 - 13:00

A Study of Early Adopters of Shared Services and Cloud Computing with the HE Community

ABSTRACT

The authors of this paper conducted a substantial review of activities supporting agility necessary to support the rapidly changing requirements of the academic sector in this decade; in particular the study considered areas of activity including shared services, cloud computing and enterprise architecture developments within the HE global community, and also within other public sector and commercial sectors. The extensive study will be published by JISC in the UK during spring/summer 2011.

The authors consulted extensively with many of the leading IT vendors to identify hundreds of examples of shared services and cloud computing projects which are in production use. They have reduced these in to a smaller range of projects and described several different models for the principal officers within a University to make sense of the opportunities in these areas.

The study then took specific case studies to explore in much greater detail what factors have led them to be successful (or not!) and what lessons can be adopted by HE institutions who may wish to expand their use shared services and cloud computing technologies.

This EUNIS paper will draw upon many of the findings which the authors have developed to inspire UK HE institutions to begin to change their institutional strategies and behaviours to take advantage of the efficiencies and agility that these new approaches can offer. Most are relevant to the academic community globally. A copy of the full report will be available of the HE Associates website.

1. INTRODUCTION

The FEAST report into early adopters was commissioned as part of The Flexible Service Delivery[1] programme which focuses upon helping UK universities and colleges to improve the IT service delivery for students and staff by helping institutions to (a) understand and strategically plan cost-effective changes to their service provision, (b) pilot new service delivery options, and (c) work towards enabling greater flexibility and modularity to their IT service provision. The programme is being driven by the need for greatly increased:

- **Efficiency** in cost and time saving;
- **Effectiveness** in business process and service quality improvement (enhancing the student and staff experience of administration); and
- **Enablement** in improved agility, flexibility and ability to respond to new opportunities.

A. ENVIRONMENT

The sector is undergoing one of its largest challenges in recent decades and probably since the expansion of the sector following the Robbins Report[2] in 1963, which revealed the need for additional resources in British higher education. His report eventually led to the major expansion of higher education in the Great Britain in the 1960s and 1970s. Now in 2011, a fundamental shift in the funding of Universities has been instigated in England and related issues apply to other UK countries. The UK faces considerable financial challenges in relation to public spending and an expectation that the state will significantly reduce the public sector spending and expect enterprise to fill the gap created. Students will fund a significant proportion of their education's cost with fees supported by loan schemes and bursaries being negotiated via a regulator.

Additionally, there is an expectation that in all areas of public and related sectors there will be increased efficiencies through sharing and pooling and potentially from outsourcing. Competition within the nation is rather an artificial artefact arising from semi-autonomous institutions competing for 'best students and intellectual capital' rather than working collectively towards underpinning UK best interests. The think-tank Policy Exchange published[3] 'Higher Education in the Age of Austerity: Shared Services, Outsourcing and Entrepreneurship'; this document makes three proposals:

- shared services "can make a sizeable contribution to making UK universities more competitive in the future and allow for the utilisation of savings in support of teaching and research";
- outsourcing: the report claims that £2.7bn could potentially be saved annually by the HE sector if the provision of certain non-core services was transferred; and
- entrepreneurship: universities are encouraged to make a concerted effort to reduce their reliance on government funding for support; thus they must give due consideration to increasing their level of engagement with private business in order to diversify their income streams, and seek to take a more entrepreneurial approach to generating revenue from commercial sources.

[1] http://www.jisc.ac.uk/whatwedo/programmes/flexibleservicedelivery

[2] http://www.educationengland.org.uk/documents/robbins/

[3] http://www.policyexchange.org.uk/images/publications/pdfs/Higher_Education_Austerity_2.pdf

The UK HE sector regularly raises VAT as a barrier[4] since they currently have to pay VAT on shared services or outsourced operations (but not on in-house activities). The Policy Exchange report cites "lack of enthusiasm" by university executives and claims this is due to a "cultural aversion to institutions working together" and suspicions about the private sector.

The 2008 JISC survey[5] found that fewer than 50% of institutional managers would "readily consider" a shared service in key areas of administrative operation, and in core areas it was below 18% e.g. finance, timetabling, and customer relations. However, the fiscal environment is significantly changed as in 2008 many HEIs had seen a prolonged period of growth and most improvement in fiscal environment and an expectation that the fees issue would deliver a positive long-term benefit.

It is reasonable to assume that Government will seek from the wider public sector related areas the same sort of efficiencies that it desires for central government through efficiency improvements in back-end services and transparency of costs through outsourcing, etc.

B. TARGET SENIOR MANAGEMENT

The governance of institutions has been significantly professionalised with far greater accountability to the Board with a majority of Lay members who should be expecting clarity of strategy and vision. However, this perhaps currently supports competitive aspects rather than collaboration and sometimes their attention is diverted from the main focus of institutional purpose which is the core mission of Teaching & Learning and Research (to varying degrees) towards supporting legacy services and agendas which could be more efficiently executed collaboratively or through adoption of more flexible approaches.

Institutions appear to fund services and activities supporting core activity with little proportionately to the benefit achieved; evidence of the linkage between expenditure on non-core activities and core mission achievement is to say the least weak. Funding tables seem to demonstrate that institutions fund non-core activities in relation to income and size rather than service contribution to core mission. Legacy funding patterns particularly around staffing hinder significant reappraisal and re-evaluation of services.

The changes impacting the sector are at least twofold, funding alone would require change but student expectation is changing due to familiarity and expectation arising from experiences with technologies and services in other domains. Institutions are generally not ready for the agility required to support new technological and service cultures; agility is a key term as it expresses the degree of urgency that will be inevitable. The full report is concerned with emerging technologies and paradigms with a particular focus on innovation to support flexible service delivery and the whole new paradigms of shared services, enterprise architectures and cloud computing. The report is written as an overview of technologies but with emphasis on examples from the sector and other industries both nationally and globally.

[4] http://www.timeshighereducation.co.uk/story.asp?storyCode=400492&sectioncode=26

[5] hhttp://www.cio.com.au/article/189721/strategies_dealing_it_complexity/ttp://www.jiscinfonet.ac.uk/infokits/shared-services

C. COMPLACENCY

It would be easy for the sector to be complacent; there is example after example within the UK HE and FE sectors of success through collaboration and sharing; the big successes often pointed to are in respect of purchasing consortia, staff development activities, recruitment with UCAS, JISC information services and infrastructure examples such as the JANET network.

However, in comparison to activities in industry and local government the big opportunities are not being taken. The sector's institutions operate autonomously and spend very significant funds supporting administrative systems whose overall functions are similar across the community. A few major suppliers dominate the core administrative systems supporting HR, Finance, Student records, etc. Most institutions pay a very heavy capital cost per system on a periodic cycle together with annual maintenance for software and hardware. Localisation (tailoring to specific institutional requirement) is expensive and furthermore increases the cost associated with each upgrade during the product lifecycle. Other industries are looking to acquire their administrative systems on a shared basis either within an enterprise or as a collective from some service operating company. UK institutions argue strongly that their autonomy and particular requirements cannot be met from a 'market' service and that localisation provides competitive advantage, although few can actively demonstrate this to the bottom-line! The sector has a poor approach to costing all activities which would more clearly demonstrate the cost and benefit basis for certain investments and service activities.

There are many reports which show how the pace of change is impacting technology related service areas. Education and its supporting infrastructures will certainly be challenged if only a small part of the reported saving projections are realised. In particular, new players are entering the market for the provision of HE and FE courses and will cherry-pick courses where they can exploit a green-field approach providing quality education at a cost that will challenge the former provider market.

2. AGILITY

The rapid transformation of the surrounding environment and emerging competition impacting the sector is going to require a much more nimble response from institutions; each likely to adopt a direction and urgency to supporting its perceived mission priorities. The supporting back-office to front-office functions delivering the core business (Research, Teaching and Learning) will need to respond much more rapidly than has previously been the case. The focus for back-office will be to demonstrate real value to the core functions, embracing the end-users requirements, with efficient and cost-effective delivery focussed towards direct linkage to the core business requirement.
The Flexible Service Delivery[6] (FSD) programme "*...is about UK colleges and universities making efficiency savings and improving institutional agility through business process improvement, effective integration and sharing of their information systems. This change initiative is also about streamlining service provision and considering new modes of delivery, such as shared services.*" The JISC Flexible Service Delivery website[7] gives a comprehensive overview of the programme.

[6] http://www.jisc.ac.uk/publications/briefingpapers/2010/flexibleservicedeliverybpv2.aspx

[7] http://www.jiscinfonet.ac.uk/flexible-service-delivery/

Competition between institutions will be driven by quality, price and supply initially but over time responsiveness to the market will mean that the consumer requirements will prevail. Institutions have evolved relatively slowly in their development of academic programmes and delivery models; the increasing pace of change is likely to be rapid and only the fit will be able to capitalise on opportunities as they arise. Thus the Flexible Service Delivery (FSD) programme is intended to demonstrate mechanisms by which the community can individually or jointly address and implement transformational change. These changes will include real efficiency savings as well as other measurable strategic and educational values, through the streamlined and flexible provision of administrative and student services resulting in

- Greater efficiency in terms of cost and time savings;
- Enhanced institutional agility and responsiveness to change;
- Improvements in the student and staff experience of administrative processes;
- Improved access to and exploitation of corporate and student data across their information systems;
- Improved means by which institutions manage and provision their administrative and student services.

3. TRANSFORMATION

Agility alone will not be enough; increased efficiency and end-user support will demand new approaches including shared services, commercial partnerships, and outsourcing. The report attempts to bring all of these considerations into perspective for senior managers not necessarily conversant with technologies, architectures and emerging paradigms for service delivery.

The FEAST report provides a very high overview of the key architectures supported by introductory sections with prolific references to key supporting documents and resources. In particular the report highlights key areas where it is felt institutions should be directing their attention; it highlights the role for the governance to have a clear understanding of the enterprise architecture which supports all core business activities. The enterprise architecture should be able to directly relate to business needs and translate these requirements to services and services fulfilment combined with a clear costing associated with all activities. Historically, the administrative and academic computing environments have been separate but the demands of the emerging environment supporting e-learning and e-everything is such that it must be treated as a single business environment underpinning core business requirements.

The diversity of an institution's business functions makes integration of diverse systems essential to fulfil all the mix of activities experienced; however, that integration must be strictly controlled to minimise complexity. However, monolithic systems with point-to-point integration must be resisted as an approach due to the lock-in that can result and overwhelming complexity that results. Agility requires that systems and their services can be changed and modified rapidly without impacting other systems within the environment.

A. TECHNIQUES AND APPROACHES

The administrative environment supporting the core business is being transformed by new techniques related to business processes, service architectures and enterprise architecture design mechanisms. Virtualisation is a valuable approach to optimise server architecture usage and

efficiency; the green data centre is inevitably going to be demanded from all areas related to 'public' funding and will bring its own demands for efficient operations. Collaboration between institutions on administrative support services could produce large savings with no little or impact on core business. Significant consideration is necessary with respect to economy of scale; small institutions can be disproportionally disadvantaged in acquisition and support for administrative systems; shared infrastructure and shared services delivery can mitigate these issues.

A more cost-effective approach is necessary for the delivery of administrative and desktop computing; there are examples in the report where this has been out-managed/sourced cost-effectively and is a commodity like service. All services should be examined to consider their potential for a more cost-effective delivery.

Core business services and activities will increasingly be driven by data; high data quality is essential and has been widely cited as one of the major issues associated with either system migration or moving into a shared services model.

Understanding the dynamics of process and services is essential, the 80-20 rule is paramount; often real understanding of what activities are executed most commonly will only arise through a measured approach to developing real statistics. With understanding of execution parameters services and processes can be considered in terms of ROI in investment associated with them.

Institutions will inevitably have to get much better at major projects and change management issues. Only if the staff can be actively engaged will agility become core to the institutions culture. In fact it is demonstrated in the case studies of the report that the skills required are often absent because major transformations require new skills particularly where services are out-sourced to a supplier or as part of a shared service.

Relationships with supplier and partners must be based on clear contractual arrangements and executed through change management procedures; however, contracts should not be so restrictive that they constrain the agility that was sought in the first place.

Business process management as part of an overall enterprise architecture approach has proved very effective for linking the business requirements more closely to the supporting processes, data flows and human interactions.

Clear understanding of business processes execution supported by timings and data measurements can provide clear indications of where efficiency improvements will deliver increased performance and savings; the 80/20 rule operation is important in relation to process activities. Bottleneck can readily be identified and resolved.

SOA is an emerging approach being widely used in commerce and applicable to academic IS environments. Together with EA and BPM it is possible to build more agile environments from legacy systems with relatively simple supporting infrastructures and environments.

B. SHARED SERVICES

Experience in the sector as a customer or partner of shared services is high; however few institutions have in depth experience of being a service provider to others and internal staff or governance may not readily adapt to the necessary cultures and requirements of being a service provider where accountabilities are significantly different. Adopting services from a provider similarly requires a different culture with in-house staff needing to acquire skills in contract negotiation and management and also skills to liaise between the provider and end-users. The different models for shared services have arisen to accommodate the diversity of requirements and approaches; at the heart of these services is the need for a clear and pragmatic governance model.

Institutions should be absolutely clear about what services should be provided internally because they give a significant competitive advantage; services not on this list should be considered on merit and potential as candidates for sharing or outsourcing. Institutions cannot just wait to be customers; shared services require active engagement by the partners determined by the governance established for the shared service; hence, a pro-active approach is required.

The rich shared service environment of the sector must embrace a more commercial approach requiring repurposed governance models supported by business plans demonstrating sustainability. Top-slicing is desirable as a mechanism of providing seed-corn funding to develop pilot services but with a much greater expectation of capability of the service and its proposed governance model to develop a sustainable service model for its future delivery.

The report discusses models of shared service: top-down v bottom-up; models of sharing based on various groupings including geography or peer groupings, or on operating models based on who does it. Bottom-up shared services development should be encouraged but with much more support for understandings of commercial realities that are associated with the operation and long-term sustainability with clear recognition of the consequences surrounding services demise. Bottom-up will often deliver the innovation from the grass-roots close to the end-user requirement.

The sector should seek to provide or support launch of services in areas where commercial partners are absent; ideally through organisations with a semi-commercial basis owned by the sector. Direct competition with the private sector solely for financial savings must be carefully considered with regard to public private subsidy issues.

C. THE CLOUD

The cloud is being hyped as all things to all people; however, there is clear evidence that the basic direction of the paradigm is going to produce transformation rather than just change. In this overview, the Cloud will not be described in any detail. Several sections of the main report provide adequate introduction and references to major resources.

Some services such as out-hosting for email and similar are now widely adopted for student services with some institutions looking at migrating similar staff services. The ROI is high as many institutions have established the basic service parameters and agreements and the end-user experience is high. Few standards (except service suppliers de facto) exist in the cloud so beware that lock-in can readily be created unless specific measures are taken to prevent this. The Cloud is generally not for

beginners; it is wise to have considerable experience with a virtualised server environment before migrating services towards the cloud from this environment. Security in the cloud for certain services is a key issue particularly where personal data may be located off-site.

Recognising that (commercial) suppliers are organisations required to make a profit, liable to mergers or acquisitions, and following a strategy which may not align to that of the institution is vital so that all risks should be mitigated appropriately. The Cloud offers a layered approach offering access to infrastructure, applications, services and now business processes. The skills for utilisation of each layer are different and impact upon different user communities and skill sets within the institution.

Cloud computing is an enabler for the efficient use of resources and facilitates a route for managing capital and support costs. However, Cloud computing is not about technology, it's about process and the business model. Adoption of the Cloud requires a degree of maturity by both the institution and its IT staff; it is not an-all-or-nothing paradigm; it is possible to enter gradually and appropriately.

Smaller organisations may wish to seek access to unaffordable (if local) world-class services through shared access and cloud paradigms. Expertise which is unavailable due to diseconomy of scale should be mitigated by adopting access to higher layers of service provision.

4. RESPONSIBILITY ISSUES

Historically, administrative systems in institutions have operated in silos where staffing and process operation were operated by independent divisions of staff. Often, the only common element was that the IT system would be operated by a common centralised IT staff with prerequisite expertise in the technologies and software systems of that functional silo. It is no wonder that many users would complain of the need to re-enter common data on multiple systems. The lack of integration between systems would increase cost inefficiencies and risk.

The report as other documents of this type highlights a clear role for a CIO-like role with direct access to the governance layer of the institution; this role should be divorced form the operational IT/IS management. The key responsibility should be to ensure the Enterprise Architecture is aligned to the business requirements and is designed to support the agility that is going to be vital in the transformation of the sector.

The CIO role should work to reduce complexity and increase visibility of the relationship between the business activities and the supporting EA. The CIO role should balance the demands for tactical activities and the longer term strategic requirements of the organisation. The CIO role should be seeking assurance that the necessary skills and steps are being acquired to utilise virtualisation and develop private cloud experience, compare external services provision on a fair basis, and build an enterprise architecture that will support the agility necessary for the anticipated consumer demand. Institutions should develop within its senior governance post a role for the champion of the Enterprise Architecture charged with responsibility for ensuring the active linkage between the business activities and business demands and it’s supporting IT services with a remit for ensuring agility and responsiveness.

Enterprise Architecture explains the mechanisms of how people, processes and technology relate together. This facilitates informed decision-making about enabling technologies and approaches including: Business Process Management, Finance Management (base-lining and cost-benefit analyses), Service Oriented Architectures (SOA), product disaggregation, standards and interface development, supplier partnering, Shared Services, and Cloud computing to name just a few.

Enterprise Architecture has been used widely for at least 20 years. It offers a strategic approach to aligning ICT strategy and implementation with organisation strategy, so that ICT services work together properly and enable the organisation's vision. Competing methodologies exist although some are more widely used[8].

Often, because project teams fail to understand the fundamentals of Enterprise Architecture, they make decisions which inevitably lead to increased implementation costs, time overruns and more expensive subsequent upgrades and support costs. It is vitally important to understand the complete life cycle of data elements across the complete enterprise. A failure to get this deep understanding often results in data duplication and data inconsistencies across separate application systems. These lead to greatly increased business process costs as administrative staff create procedures to try to keep the data consistent and to rectify data errors.

Business process management addresses the alignment of business processes to the aspirations of its clients. It holistically promotes business effectiveness and efficiency while striving for innovation, flexibility, and integration with ICT as a key tool.

5. FEAST REPORT CASE STUDIES AND VIGNETTES

The report has major case studies on activities in the academic sector and related areas from which lessons and understanding of issues can be derived; included are projects concerning business process improvements leading to an out-sourced approach; transformation through outsourcing, developing a shared service as a top-down instigation; using SOA in a pilot to integrate diverse administrative systems at multiple universities, etc. Also the report has an extensive selection of mini-cases which we present as vignettes covering the breadth of agility and shared services. Utilising the case studies and vignettes and the overall literature survey, the authors present some high-level guidance for institutional consideration.

6. FEAST GUIDANCE

The report has commented on the consequences arising from the current fiscal and funding environment and identified the priority for institutions to be able to be responsive. Transformation is essential to meet challenges arising from consumer ethos, end-users with high technological expectations, and emerging competitor requirements; hence the emphasis on institution agility and recognising that savings and service improvements are possible through shared services, cloud and architectural re-designs to non-core activities. However, the same approaches can be used to support the core activities of Teaching, Learning and Research by delivering architectures, tools,

[8] http://msdn.microsoft.com/en-us/library/bb466232.aspx

services, integrated within the enterprise architecture of the institution but focussed towards support for e-administration, e-learning, and e-research activities.

A. HORIZON EVENTS

Few are unaware of the change impacting the sector but what does not seem so evident is the awareness of the pace of changes impacting them over this decade; change driven by funding but as importantly by new technologies and the end-user embracement of them. Staff and managers are, by definition, usually of an older generation to most students and may not feel capable or confident of making investment decisions to support new paradigms embraced externally by the incoming student community. There will be an increasingly consumer-like relationship with high expectations of quality provision and support enhanced by technologies experienced in other social spaces and expected by them to be embraced within the context of learning environments.

Thus institutions must seek to embrace information strategies, supported by technology that can maximise the potential of data environments to enrich and enhance the learning experience. Data should be capable of being entered into the supporting administrative computing environment once, then shared within systems and made accessible to all services appropriately without further human intervention. Ensuring high data quality should be a major thrust and processes operating on data should, where possible, be automated with mechanisms for monitoring process flow and determination of bottlenecks. End-users should be supported by a CRM-like environment that facilitates personal access to process flows and provide appropriate mechanisms for issues to be escalated.

B. STRATEGIC ALIGNMENT

IT and IS are increasingly pervasive in every aspect of the core business activities of an institution; however, in many institutions the IT/IS environment associated with the overall enterprise architecture is poorly owned within the senior management. An IT Director (or equivalent title) will daily wrestle with the operational and management issues of the operating services whilst the strategic and business inter-relationships are poorly owned. Administrative heads must increasingly be responsible for the business process and activities under their leadership but the integrating nature of systems and data is such that an overall architect of the mapping between business requirements and systems to support is required; this may be in a post described in the report as the role of the CIO.

C. THE ENVIRONMENTAL AGENDA

Inevitably, there is increased government pressure on all public-sector related areas to adopt best practices with regard to carbon generation arising from IT/IS architectures; also, the indirect implications of the increasing energy prices will demand increased efficiencies. The report identifies the excellent work done by the JISC in this area and institutions are encouraged to use published materials and resources. Furthermore, institutions adopting service supply contracts should give consideration to the implications arising for carbon production of the service from the chosen supplier; increasingly, best practice will need to be cascaded within supply arrangements and should be capable of being reported.

D. SHARED SERVICES GOVERNANCE

Shared services or practices have been widely adopted in the sector but most are peripheral rather than centric to core-business with a few exceptions. The shared service VAT issues are well understood but the obstacle can be over-presented against opportunities that may be achievable.

Shared services often arise through institutions collaborating to service a mutual requirement termed herein as bottom-up. These services are often characterised by servicing institutions in a small area (local/regional) or those sharing a common aspiration. Transition of an operating small shared service to a national service is fraught with difficulties due to governance, staffing, finance and sustainability issues. Institutions will be increasingly reluctant to hold responsibilities for shared services delivery; recognising and costing real overheads on services, developing financial models that will sustain start-up through to services delivery and also cater for the termination of services and their costs will burden developers of essentially non-core activities. In a tight fiscal environment, institutional managers will focus on their core business activities.

Support is urgently required to facilitate the development of shared services within and for the sector; specifically required are skills in what effectively are business start-up skills, governance, finance and operating processes including models for SLAs. Given the difficulties associated with service operations, then commercial models must become an attractive option. The sector must work more closely with commercial partners to develop a market for services which recognises that institutions cannot sensibly service all their own requirements and a role exists for shared services.

E. DIS/ECONOMIES OF SCALE

Economies and diseconomies of scale are fairly intuitively understood; however, for certain services, right-sizing can be a significant issue. We are all aware of organisations and services that have found it difficult to embrace growth whilst still delivering the nature of service that built its reputation. It is essential to define what qualities are to be achieved by a given service and how best to construct its governance, management and operations so as to meet them. One of the most common mistakes associated with scale is for too rapid growth and a false belief that breadth can be rapidly increased whilst also growing volume. Over-diversification is often taken as a protective measure against future downturns; equally over-promising is a serious downfall. Shared services must determine their right-size as they plan their future. Determining a model for sustainability with appropriate service quality characteristics is essential and the governance must have the necessary business skills to embrace all these issues.

F. SYSTEMS ARCHITECTURES

Institutions spend significant percentages of their budget servicing non-core activities including the administrative support for that core. Little competitive advantage is achieved from many of the non-core activities but if these are undertaken poorly then it will be very evident to the end-user.

Integrated ERP systems have not become common in the sector and supplier interest in pursuing this goal seems to have waned. Most institutions have acquired best-of-breed systems and point-to-point integrations to maximise efficiencies. These systems provide functions which are replicated between systems and often work to support what are administrative silos. A clear understanding of

what modules and functions within these systems are executed commonly and which rarely are often poorly understood. Disproportionate effort can applied towards rarely utilised requirements and in procurement undue weight can be placed on functionality which is lightly used. Economies of scale are evident in other industries through the shared operation of administrative environments across an enterprises separate businesses. Clearly similar approaches could be undertaken by institutions utilising common or shared systems. Institutions should look towards less customisation of purchased systems and seek to utilise systems 'out of the box' and instead review internal business process to maximise potential from systems as acquired.

Administrative systems are common to most institutions and the number of suppliers to this market has not been increasing; institutions purchase systems by tender to a fairly common requirement and then spend excessively on measures with integrators to tailor them to perceived 'local' requirements and to facilitate integration with other systems in the environment. Suppliers have no particular desire to adopt more common approaches or to adopt standard interfaces to more readily support integration; equally customisation can be a source of additional income as it has to be applied to successive software releases.

A shared service approach to delivering core administrative services has been demonstrated by An Chéim[9] in Ireland to be effective and could similarly be replicated within the UK sector; this might be warmly welcomed by smaller institutions who could benefit from access to world-class systems and higher levels of support than they could themselves achieve. Suppliers are unlikely to move towards providing cloud based services-oriented administrative services whilst the current market approach is so lucrative; however, the sector could take measures to instigate action towards this approach.

G. ADOPTING AGILE TECHNOLOGIES

IT staff should be supported and encouraged to embrace more agile approaches to technology and services provision; experience shows that staff are keen to innovate to meet new service challenges but because of the intellectual capital investment in existing systems and infrastructure they are slow to embrace radical change on these existing environments.

Historically technical teams would seek funding for investment in new services infrastructure including software and then seek to grow the usage of those technologies/services despite being poorly placed in the organisation to so do. Now the business requirements must drive the investment and staff should traverse the (business) gap between systems and services delivery. Virtualisation has been adopted by many institutions in certain areas including computing support for research; the approach is highly desirable in the progress towards cloud technologies, both private/public and hybrid.

The gap between the business requirements and the technological provision needs to be closed so that technical staff fully understand the business dimension and end-user perspective and business managers appreciate what technology could deliver for them and the cost of so choosing. Concise and continuous communication on this theme is desirable.

[9] http://www.ancheim.ie/

H. CLOUD SERVICES

Cloud computing is much more than a technology and rather more a paradigm of approach; it has been shown that its adoption requires considerable maturity which has to be gained by travelling along the path of virtualisation towards private cloud and then towards hybrid or public cloud. The cloud as a paradigm has the potential to be transformational; however, the hype at this time is considerably larger than the reality. Institutions should assess their own competencies and maturity with regard to the emerging cloud paradigm.
Institutions should build skills in cloud-related technologies perhaps by instigating a private cloud and then experimenting with augmenting their capabilities through a hybrid cloud approach.

I. EA, BPM. SOA ETC.

A full understanding of the costings surrounding all business process activities is highly desirable as it gives an understanding of the desirability of adopting alternative approaches and a mechanism to benchmark against peers or to measure the benefit that is achieved following investment. The 80-20 rule should be carefully considered; it is very easy to spend disproportionate effort supporting activities and processes that are rarely executed. Institutions should be encouraged to develop costing skills to measure all aspects of administrative activities and to derive the costs associated with individual business processes.

The new paradigms require staff to learn new skills. Time must be provided for this and suitable projects without critical constraints should be utilised to develop these new skills. Within the FSD program, excellent exemplars are documented using TOGAF and similar tools and real benefits are demonstrable to encourage the wider community of institutions.

J. STAFFING

There is widespread expectation in the IT media that the headcount associated with IT support will be reduced as a consequence of emerging technologies and the commoditisation of services. In an increasingly shared and service-oriented environment, the institutional skills to support tendering, contracts development and services supply management will need to be developed.

Institutions should plan for the acquisition of the new skills needed within the IT and business IT support functions. Sector bodies should seek to develop change awareness and training support to equip institutions for a services transition.

K. COMMERCIAL SERVICES

Most institutions are already using commodity services to support student services where these are available, e.g. student email etc. A few universities are seriously considering adopting similar services for staff support. Increasingly, commodity services will be delivered free at the point of use; however this may require support from income derived from advertising or similar targeted access of end-user communities and institutions will have to have pre-considered their willingness to embrace these models of partnership.

Legal support is very expensive; within the community, institutions should seek best practice from early adopters with regard to contractual arrangements regarding service contracts. A model for early adopters to financially benefit from sharing their experience would be desirable and pilot funding of activities should be undertaken so that the sector lessons can be made freely available in the community. Institutions should be cautious of potential lock-ins to vendor technologies which might alienate end-users selecting 'rival' supplier technologies or interfaces.

Services procured from external providers (commercial or shared services) must be delivered against a contractual commitment and service level agreement. Skills necessary to procure services, manage services supply, and operate through change management procedures are very different for most relevant key staff groups. The transition to outsourced services is not without its difficulties and certainly will not be accomplished at a stroke. The process requires significant change management capabilities within the institution concerned and must be carefully managed to ensure that internal key competencies to support the transition are maintained for the necessary period.

IT services staff do not have extensive experience of IT services procurement of the type envisaged to support institutional outsourcing of administrative systems, services, or processes; previously this often has been limited to hardware and software maintenance. Support acquired in relation to core services provision introduces a new dimension of responsibilities, accountabilities, and operational behaviours.

There are many examples in the sector of services undertaken in support of new administrative computing requirements (or for their integration) which has resulted in disappointing outcomes, overspends, and under-achievement. Institutions adopting a contractual partnership for any bespoke software development should institute a formal project management approach (possibly with consultancy providing appropriate supporting skills) aimed towards establishing workable contracts with timetables and clarified responsibilities for both parties, and potentially financial penalties. A change management procedure must be clearly defined and operated throughout the project lifetime.

Services procurement must recognise the impacts potentially arising from new technologies or end-user demand; the mechanisms for services revision must be formally contracted to allow services demise, services refresh, services dimension changes, etc. In particular services should be procured unbundled so that individual components can be considered in isolation. Essential in all Services procurement is planning for eventualities potentially unforeseeable.

L. BUILDING SECTOR SHARED SERVICES

JANET as a service was initiated as a bottom-up service between a few research-intensive HEIs but then transformed to be a top-down sector-wide service. Throughout its lifetime, its governance model has evolved and, in recent years, its on-going sustainability has been central to its approach.

Sector-initiated bottom-up services find migration towards top-down and commercially focussed services extremely difficult. A university(s) is not necessarily best placed to take sector initiatives where risk capital investment is necessary. Also, public-private subsidy issues have to be carefully handled. Equally, instigating top-down services within the sector can have the same difficulties

unless the scale is small and the scope is extremely well-defined. Within the sector there are many services which are 100% funded from JISC or similar funders but few that are initiated in the sector as institution-based companies directly servicing sector-only requirements; perhaps the culture of institutional services is generally ill-disposed to this approach. The supporting skills clearly exist in institutions, as seen from the number and encouragement for entrepreneurial activities; however, this largely revolves around research exploitation and rarely around a direct service provision.

Institutions generally do not encourage IT/IS services staff in these entrepreneurial activities; those that do are generally supported initially from 'pilot' funding activity and outputs are widely disseminated within the sector and potentially 'services' are launched. Services staff migrating to these activities can become isolated from their local service and a return path can become difficult.

If shared services are to be instigated within the sector, they will need a supporting agency/body that can examine the proposal on the same basis that might be applied to a start-up or spin-off company. The particular issues of business planning, costing, and sustainability must be addressed and the risks/benefits analysis be widely tested amongst the community of potential customers.

A supporting body should be encouraged to develop a model for and enable closer partnerships between the sector and commercial service providers to facilitate the requested development of sector-specific or tailored shared services.

M. SOA

The sector is gaining experience with SOA and through pilots nationally and local implementations; confidence has significantly increased that the paradigm has rich offerings to the sectors requirements. It has been demonstrated that it can be used for both institutional data integration and as a tool for sharing data across diverse administrative systems.

SOA is gaining maturity and standards are demonstrating inter-connectivity. Suppliers are beginning to see its potential within the sector and could be encouraged through some well-directed sector activities and initiatives.

7. CONCLUSIONS

The FSD program has an exciting array of projects looking at the breadth of coverage of IT services supporting the core businesses of institutions. The Program recognises the urgency of adopting agility which will service the rapid change environment that is being entered together with a greater focus towards end-user support.

The FEAST project has surveyed a breadth of activities operating in the agility areas including shared service, cloud and enterprise architecture driven paradigms. Specific examples were selected to derive case studies because of their particular relevance to the sector at this time; also a wider selection were chosen as vignettes to inform the sector and to facilitate closer study by institutions desiring to do so. The list is expanding exponentially and the project resources are finite so inevitably there are many good examples that have not been presented or are emerging and should potentially be included in the future.

The project has attempted to make some overall guidance across a diverse field of paradigms, techniques and tools. The message from these studies is that the pace of change is being driven by an accelerating provision of technologies and end-user expectations. The new paradigms are rapidly gaining maturity and institutions should make every effort to gain experience across their breadth and prepare for adoption of many.

Shared services offer savings and operational improvements across a breadth of service types; the obstacles are generally not technical! Traditional arguments against shared services which cited the special and individual requirements of institutions are generally not backed up by cost analyses and the demonstrated benefits to the core business activities.

The autonomy of UK HE institutions has prevented moves towards centrally provided IT services to support institutional administration seen in US State services and in some countries. In fact, an earlier attempt at delivering common management systems called the MAC initiative[10], was such a failure that it blights discussion of proceeding towards this approach. Furthermore, suppliers make significant profits from the current model where systems are heavily tailored/integrated into existing environments. However, the current economic crisis will drive costs-savings to be sought and new paradigms surrounding enterprise architectures and SOA may drive new delivery models for which both the academic community and suppliers alike should be prepared as the emerging private institutions are adopting this approach.

10 http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=EJ456007&ERICExtSearch_SearchType_0=no&accno=EJ456007