IT Integration for L'Université de Strasbourg

Executive Summary
This report summarises the findings of a EUA consultancy visit to support the integration of the Information and Communications Technologies in the formation of the University of Strasbourg. It provides a health check on the work already undertaken as well as identifying emerging issues that require closer or more immediate attention.

In summary, the report identifies that plans for ICT integration are progressing smoothly and are well advanced in some aspects. A new organisational structure has been proposed which is logical and is gathering appeal from across the four constituent organisations. Furthermore, discussion has already commenced on how to integrate infrastructure and systems.

The consultant felt that this progress is a remarkable achievement over such a short time period and should be seen as testament to the competency and expertise of the project manager and her team.

Looking to the next steps, the consultant suggests prioritising the integration of systems, firstly focussing on externally facing systems (website, e-mail and phones), secondly on student facing systems (e-learning and portals) and then lastly on corporate information systems. He recommends that this last category of systems is not rushed as the merger provides an opportunity to revolutionalise the way in which corporate information is managed: enabling the introduction of new functionality and business intelligence which will make the systems fit for a "university of tomorrow".

Furthermore, the consultant identifies that integration of systems and infrastructure is relatively easy when compared to integration of people. He therefore suggests that a systems review would also provide a catalyst for IT staff to unite behind, allowing them to be included in the decision making process and understand the personal opportunities that the merger provides e.g. attainment of new skills, more varied work and improved career opportunities.

Lastly, the consultant identifies that work must commence on refining the governance and standards under which the integrated functions will operate. These include the definition of strategies, policies and methodologies for decision making.

The report does not recommend specific systems or technologies as this would require a greater depth of analysis. However, opinions and thoughts are provided on the criteria for evaluation and arguments for and against particular systems.

The report is in two sections. The first is a SWOT analysis of the integration of ICT identifying the project's **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats.

The second section discusses particular aspects of integration that arose during the consultation visit:
- Governance
- Organisational Structure
- Helpdesk Support
- Cultural Change
- Physical Location
- Definition of Standards
- Systems Integration

Section 1.
SWOT Analysis (Strengths, Weaknesses, Opportunities and Threats)

Strengths
Great project management team with strong well articulated vision.

A knowledgeable work force with valuable, up-to-date skills and a good reputation for delivery within the institutions as well as, more broadly, across the Alsace region and France.

All four institutions already have good reputations and therefore the new merged university has the potential to climb high in the world rankings and to be "greater than the sum of its parts".

There appears to be huge good-will from within the four institutions and little resistance to the change.

The French government are supportive and interested in the success of the project.

The existing systems are reliable and broad ranging (albeit that they lack functionality). In addition, there is a fair degree of uniformity between the four institutions over which systems are being used.

Generally, students are pleased with the IT facilities and support for the use of ICT across the four institutions.

New legislation provides greater independence and freedoms, including the freedom to chose infrastructure and systems based on the best interests of the university.

Weaknesses
Leaders for the new departments have not yet been identified. Until these appointments have been made, the new structures will continue to be theoretical and abstract. Some firm foundations are needed promptly to alleviate anxiety and maintain momentum.

The current systems appear to lack core functionality and do not meet expectations. The provider is regarded as slow and unresponsive.

There are a lack of documented procedures and policies from which to develop common standards.

The project currently lacks specific targets and performance indicators nor how will success be determined?

There appears to be no standard methodology for managing projects and change.

Opportunities
Technology is often seen as an enabler of change with business processes being redefined around technological advancement. For example, over the last five years the use of Web 2.0 technologies has transformed the way in which students interact with the university making them more self-sufficient for their administration on-line. As a consequence, student experience is improving and university costs are falling. The creation of a new university will provide Strasbourg with an opportunity to redefine its business processes in line with 21st Century expectations.

As well as providing a coherent uniform structure, integration will provide the opportunity to upgrade systems and invest in infrastructure to provide a step-change in technology. For example the new university could take advantage of new and emerging technologies such as service-orientated-architecture for integrating systems or in green computing to reduce energy costs and environmental impact.

The new university could use IT to distinguish itself from other universities e.g. to provide higher quality services, enable more distance learning and further international collaboration. If the merger of IT is approached strategically and afresh, the merger could allow Strasbourg to develop a distinctive unique selling point that is efficient and student focussed.

There are already well stated, strong strategic reasons for merging the three universities: global competitiveness, increased income potential and greater inter-disciplinary opportunities to name but a few. However, the merger will also give rise to indirect by-products, two of which carry considerable benefit in themselves: "economies of scale" and "critical mass".

Economies of Scale: "the ability to reduce per unit cost through increased transactional volume". While cost reduction is not a key objective, the merger should realise savings from volume discounts in procurement, reduced duplication of processes and reduced maintenance overheads. Furthermore, if efficiencies are derived then their implications will be magnified through the aggregated and significantly larger user base.

Critical Mass: "to provide a sufficiently large enough level of resource to enable services to be sustained and resilient". By bringing staff together (both physically and functionally) a department will be able to provide a greater depth and breadth of service e.g. improved cover for staff absence, longer opening hours or broader support coverage.

Threats
The pace of change is ambitious by any standard. Merging four institutions is very complex and by rushing the integration of IT, things may get overlooked, mistakes may be made and more importantly, opportunities to invest, re-engineer and realign may be missed.

Some of the existing technologies are already felt to be inadequate and unresponsive. Spending time merging these legacy technologies will distract from the more important task of renewal and investment in new technologies for the future.

Some consider the AMUE business model to be unsustainable with universities seeking alternative solutions and by-passing AMUE to liaise directly with SAP. Even SIIG have developed their own software to compensate for the lack of functionality in AMUE's systems. The impact on the new university would be significant if AMUE failed.

Section 2
This section discusses the following aspects of integration:
1. Governance
2. Organisational Structure
3. Helpdesk Support
4. Cultural Change
5. Physical Location
6. Definition of Standards
7. Systems Integration

1. Governance

1.1. The proposed organisational structure is sound and has already achieved a fair degree of acceptance. The separation of the executive, strategic decision making body from the operational management is a good model and the addition of the "assistance à maître d'ouvage" will ensure that decisions are well informed and implementation is feasible.

1.2. Common policies will need to be defined and agreed to ensure there is a common understanding for acceptable use of the network and the university's systems e.g. when and how the network can be used for social networking, peer-to-peer file sharing, unsolicited e-mails etc.

1.3. It is also likely that software licenses and maintenance agreements will need to be renewed under the new University's auspices and that all users will need to sign new agreements to accept the terms and conditions of use of the University's software and network.

1.4. The organisational structure must be underpinned and supported by well defined decision making methodologies and procedures. Best practice shows that decisions must be informed by business plans which should fully describe the proposed investment and answer questions such as:
  1.4.1. Who will the investment benefit?
  1.4.2. What is the benefit or return on investment?
  1.4.3. What cost savings or efficiencies will be made from the investment and where will savings accrue?
  1.4.4. What is the full cost of ownership over 5 or 10 years i.e. include maintenance, support and other on-going costs.
  1.4.5. What is the life of the investment? When (and under what circumstances) will the investment need to be replaced?
  1.4.6. What are the implications of doing nothing?
  1.4.7. What are the implications for delaying investment 1,2 or 3 years?
  1.4.8. What alternatives have been considered and why were they discounted?
  1.4.9. What alternative sources of income have been investigated?
  1.4.10. Is the investment dependent/linked to the success of any other initiatives/investment requests?
  1.4.11. What analogous operations, processes and initiatives could this investment have synergy with?
  1.4.12. Could economies of scale be achieved through linkage within the University or externally with a partner?
  1.4.13. What is the environmental impact of the investment?
  1.4.14. How can the investment be used in marketing the university?
  1.4.15. How will the investment be procured? (tender, consortia etc)
  1.4.16. How will returns on the investment be maximised?

1.5. Similarly, if the "maître d'ouvage" consider embarking on new projects then each project should be managed according to a pre-defined methodology e.g. PRINCE 2 (see http://www.prince-officialsite.com/home/home.asp). A project management methodology will ensure that the project objectives are clearly understood; that the project team represents all the necessary communities; that risks are monitored and that resources are managed.

1.6. The new university will need to define new operational plans and strategies which staff can contribute to and feel ownership for. It may be that IT and ICT strategic objectives can be included in a new over-arching University Strategy, or it may be more appropriate to develop strategies specifically for Information and ICT. These strategies may cover general principles such as "minimise data duplication" as well as specific performance indicators such as "upgrade to Voice Over IP (VOIP) by a particular date".

1.7. Increasingly, universities are able to claim for overheads when obtaining research funding (e.g. HR, Finance and ICT services). In addition, fuller consideration is being given to the costs of delivering teaching and learning in order to determine whether a unit of study is economically sustainable. Consequently, the new department will need to develop procedures and accounting models to attribute costs to the appropriate university activity. This may involve internal charging and markets, with funds being transferred within the organisation, or it may be a "top-slicing" model based on volume indicators e.g. number of students or subject type.

2. Organisational Structure

2.1. To ensure sustainability, organisational structures must be defined which are optimal for the university as a whole and not designed around particular people. Having defined the top level structure, the next stage will be to decide who will be in which team and whether all of the 165 staff should be allocated to the central structure or whether some should remain under local management.

2.2. The distinction of IT Infrastructure Services from Digital & Content Services is logical but the boundaries of responsibility must be clearly articulated. In very integrated areas it will be difficult both to implement the separation and for users to understand who to go to for what service.

2.3. Consideration should be given to the integration of the new "Digital Users Department" with the Library whose role is becoming more digitally based. As a university's core learning and research support service, the library plays an important role in enabling the use and curation of digital resources and is often seen as the heart of the academic environment. Recent studies in the UK have shown how innovative some libraries are becoming (see http://www.jisc.ac.uk/librariesofthefuture) and how they're now significant contributors to content production and delivery.

2.4. Careful planning should ensure research teams and other semi-autonomous units are released from the chore of operational computing and systems management. It is important that these teams are fully focussed on their immediate objectives of research, enterprise and pedagogy and not distracted by developing their own bureaucracies and independent empires.

2.5. The university must therefore assert which aspects of IT are "corporate" and therefore unequivocally centralised and those which are specific to a subject or activity and should therefore remain devolved. Corporate IT is IT which affects the ability of the university to communicate and operate efficiently as well as ensuring legal compliance, business continuity and risk reduction. Examples include e-mail, websites, servers, data storage, network security and backup.

2.6. The University should also consider how to best utilise the strengths and entrepreneurialism of ULP Multi-media (ULPMM). While my recommendation would be to centralise ULPMM's servers and infrastructure, there are some aspects that could be given greater independence and considered as a university "spin-off" with specific income targets (e.g. television production).

2.7. Currently ULPMM support audio visual technologies in 20 classrooms, however this is something that should be considered "corporate" and therefore supported centrally – perhaps by expanding the responsibilities of the existing ULPMM team to include all the university teaching spaces. Centralisation and standardisation should enable a more homogenous experience for teaching and lecturing staff with standard technologies permanently situated in classrooms. This should reduce support costs and allow greater flexibility over which spaces they are able to teach in. The "Systems" section (below) describes sophisticated timetabling software which can exploit this ubiquity to realise significant cost and space savings.

3. Helpdesk Support

3.1. Centralisation of helpdesk support should be another high priority. A single team structure should ensure that the student and staff experience is standardised across the campus and that the staff within the team feel part of a wider support structure which is able to provide a greater depth of support. It should also provide staff with greater development opportunities to gain new skills and to advance in their career.

3.2. Communication should be simplified with one central helpdesk phone number and e-mail address. Improved critical mass means that this could be staffed for longer periods.

3.3. Enquiries should be recorded on one centralised system (e.g. Heat, Touchpaper, Remedy etc). This will provide management with useful data on support "hot-spots", turn-around times, compliance with service level agreements and cost-centre analysis enabling cross-charging or identification of investment. These systems can also be used to build a valuable knowledge-base to resolve subsequent faults with similar characteristics.

3.4. The four universities already use remote diagnostic software for support and upgrades (e.g. VNC, Terminal Services, LANDesk etc) and centralisation will ensure these technologies are more fully exploited.

3.5. While being a centralised team, staff will continue to spread their time between the centre and contributing to location specific cluster teams. This split location model will combine a depth and richness of knowledge with a greater understanding of the subject specialisations or location constraints.

4. Cultural Change

4.1. In some respects the technology is the easy bit as it is continually changing. New requirements are always arising. New protocols and languages come and go. Consequently, good IT professionals are able to flex with technological change and moving to new University systems and technologies should not present too many problems.

4.2. However, change management of culture and people is more challenging. Inevitably staff will feel unsettled. Previous loyalties and team friendships will be displaced. Every individual will come with their own perspective and particular way of doing things. At best, staff will be distracted by the disruption, at worst they will not feel allegiance or belonging to the new structure and will leave.

4.3. It is therefore important to approach the cultural change management with caution and use the technological change as catalyst for non-technological change. Introducing a new project or system can provide a common framework and "lingua franca" for discussion. It can be a unifying experience that enables people to understand the reasons for the change and the benefits that it will bring. Furthermore, inclusion of staff in the decision making will allow people to take ownership of the final outcome and are motivated to see through the implementation.

4.4. Use of instant messaging services, group discussion blogs etc can further embed the cultural change and aid with the establishment of virtual teams before physical co-location is possible.

5. Physical Location

5.1. Physical co-location of staff will be important to delivering the new services and encourage the break-down of cultural barriers. Co-location would also foster the cross-fertilisation of ideas and skills, a better team ethic and "ownership" of the new over-arching university mission.

5.2. A new centralised server room is already envisaged and new technologies should allow for this to be a remote, virtualised "lights-out" environment. Similarly remote diagnostic and maintenance technologies such as thin client computing, VNC and "wake-up-on-LAN" should all mean that proximity of hardware to staff becomes less relevant.

5.3. Taking this a stage further, the new University might take the opportunity to purchase services from third parties e.g. hosted server environments or off-site automated backups. These services would reduce the capital investment costs and may provide additional resilience.

5.4. In the short-term, physical co-location of all IT staff may be difficult to achieve but it should be possible to at least bring individual teams together, particularly to differentiate front and back office staff.

5.5. It will also be important to tell students and staff where they should go to for help once the new structure is in place. If possible one IT reception desk should be promoted on each campus where students and staff can visit for enquiries, training, laptop surgeries, printing payments etc

6. Definition of Standards

6.1. The new University will need to define standards to maximise the use experience as well as reduce costs. Priority should be given to defining standards for:

6.1.1. desktop operating systems or standardising on use of thin client technology

6.1.2. e-mail protocols (to ensure common domain names and standards for handling rich text and attachments)

6.1.3. web-site formats (to ensure branding and simple navigation)

6.1.4. document management (ensure common filing systems for legislative compliance on records retention and data protection)

6.1.5. classroom AV

6.1.6. database platforms (e.g. merely SQL compliant or specifically Oracle)

6.1.7. PC's and Printers (to maximise discounts from bulk purchasing as well as spares and consumables – ink cartridges etc)

6.1.8. systems interoperability (e.g. service orientated architecture (SOA)).

6.2. Standards will provide homogeneity and familiarity for users of the services and should ensure that user expectation is both managed and met and requests for helpdesk support are minimised.

6.3. Standards will also enable flexibility over where and when services are delivered e.g. allowing teaching to be moved to different locations and enabling students to study on the campus that is most convenient to them.

6.4. Consideration should also be given to standardisation of development environments. There seems to be a predominance of Oracle development tools as well as WebObjects. Despite their cost, these tools are robust and reliable and are being continually improved and would therefore make a suitable development standard. Furthermore, there appears to be a large community of programmers based in

different French Universities with whom code and programmes can be exchanged in an open-source or open standards environment.

7. Systems

7.1. On first inspection it would appear that the four institutions have a good degree of systems commonality. However, when the detail is examined, the systems all differ in the way in which they're used and in particular in the way identity is managed.

7.2. Good identity management will be core to systems integration especially the determination of which central LDAP to standardise on and whether federated authentication protocols will be supported.

7.3. Since it will be feasible that one person may appear on two or more of the various APOGEE and HARPEGE implementations, it will be important to determine how duplicate identities will be managed and how duplicates will be removed. Overcoming identity conflicts and determining a common framework for managing personal data will be very important in defining the systems architecture for the new university.

7.4. As a new institution it will be important to be consistent when the university presents itself to the outside world. There will be new signs, new logos, new branding. Priority should therefore be given to those systems which are external facing. The key ones are the website, the e-mail system and the phone system.

7.5. An evaluation of the existing content management systems should be undertaken to determine one to become the standard for the whole university. Templates, frameworks and/or XML schemas should be defined for the presentation of information, then the considerable task of assimilating, re-formatting and re-presenting the university's information can commence.

7.6. While use of aliases and automatic redirection will overcome some of the transitional e-mail issues, the University should move quickly to standardise on one e-mail protocol and to redefine all e-mail accounts under one domain. This will not only provide homogeneity but will also ensure that conflicts are minimised when using e-mail attachments and when integrating e-mail within desktop and workflow software.

7.7. There are currently four different telephone systems all with different standards of technology. The move to voice over IP (VOIP) has already been considered and my recommendation would be to escalate the transition to this technology in order to simplify the integration of the different systems. This transition will require considerable investment in the cabling infrastructure, however such an investment would additionally benefit pedagogic, research and administrative uses of the network.

7.8. Second tier priority should then be given to those systems which are student facing i.e. the e-learning tools and portals. Standardising the interfacing and interaction that students have with the new university will be important to ensure homogenous experience and that essential student services are maintained.

7.9. An appraisal of e-learning technologies will be considered under a separate EUA consultation.

7.10. Two portal systems were described (EPPUN and ESUP) but time constraints prevented a detailed functional evaluation. Consequently, this report can not be definitive on which platform would best suit the new university's needs. However, based purely on anecdotal feedback, it would appear that adopting a nationally, open-source based system has particular economies of scale and would provide greater potential for collaboration and shared functionality. Adopting ESUP would also reduce the University's costs when compared to maintaining the regionally

specific EPPUN. Nevertheless, it is acknowledged that this decision will not be based on cost alone.

7.11. The third tier of systems integration will be the most challenging. Integration of core management systems will be complex and should not be rushed. There will be conflicts in identity data, coding structures and procedures. There will also be obstacles to overcome in the inadequate functionality of the existing systems. My recommendation is that the new university grasps the combined opportunities of greater autonomy and the fresh start that this merger provides in order to revisit the "fitness for purpose" of all of its management information systems.

7.12. It is already accepted that to define new standards, the new university will need to undertake system evaluations for their various e-learning, portal, website content management and e-mail systems. Similarly, (using the business plan methodology described in the "Governance" section) the university should evaluate which system is the most appropriate for financial management, human resourcing and student record keeping.

7.13. Anecdotal feedback suggested that the AMUE systems lacked functionality and no-longer met user expectations and requirements. This new start provides an excellent opportunity to evaluate systems which fit the requirements of the university of tomorrow not the university of today.

7.14. As well as being good management practice, inclusive evaluation will also enable cultural acceptance of systems, allowing users and service providers to take ownership and share the responsibility of the decision.

7.15. It is possible that an evaluation will determine that AMUE led solutions are the best systems for Strasbourg University but an opportunity will be missed if the decision is one of "default" rather than positively strategic.

7.16. In an earlier section it was recommended that management of teaching space should be centralised. A centralised team will be able to use resource scheduling systems such as Scientia's "Syllabus+" (http://www.scientia.com/uk/) or Serco's "Facility CMIS Scheduler" (http://www.serco.com/markets/education/further_education/facility/scheduler.asp) . These systems use data on student subject choices, staff availability and room capacity & constraints to generate highly efficient timetables thus enabling universities to realise significant space savings. Fewer classrooms mean that support and audio visual costs are reduced and that space is released for other purposes e.g. informal, learning spaces, additional office space or for co-location of services and staff.

7.17. There are a number of Business Intelligence systems in use (Business Objects, Oracle Discoverer etc). There are also proprietary solutions from AMUE and SAP to consider. It would be prudent for the new University to define a standard reporting environment for all of its management reporting and to develop the meta-data needed to maximise the usefulness of the chosen system.

7.18. As well as reporting on raw data from core operational systems, it would be useful to build a data warehouse to consolidate and control versions of the data and store it on a more accessible format. Data warehouses are essential for providing trend analysis and forecast type reporting.

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