

## DIFFUSION OF KNOWLEDGE IN AND THROUGH HIGHER EDUCATION ORGANIZATIONS

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### ABSTRACT

*The use of information systems for admissions, registration, and email has been widespread in colleges and universities for several decades. However, the rapid growth of networks and the World Wide Web, coupled with advancements in computer literacy and knowledge management systems (KM) has led to increased adoption of new applications by educational institutions. These applications include surveying stakeholders, assessing classes, and tracking faculty development [1]. Further advances have led to the integration of applications that not only enable the sharing of knowledge, but which also support the reporting requirements necessary to obtain and retain accreditation.*

**Keywords:** Knowledge Management, Knowledge Creation, Management Information Systems, Web-based Education, AACSB, Survey

### INTRODUCTION

This paper presents a brief background on knowledge diffusion and common issues in the adoption of KM systems in universities and then explores the development of a model that is being developed which allows for the diffusion of knowledge within a small business university in the Principality of Monaco (the International University of Monaco). Further discussion centres around the evolution of this system as it becomes a mechanism for managing knowledge at IUM. This includes the future development of online learning, evaluation and assessment, and ultimately real time monitoring of faculty and student progress. These are all considered within the context of the development of a system that grants easy, but secure access to information and reports critical for compliance with AACSB, and other accreditation bodies.

### History of Knowledge Diffusion

Diffusion is defined as “the act of diffusing or dispersing something“ (see [www.wiktionary.com](http://www.wiktionary.com)). Dispersion is defined as “the act of scattering data”

(see [www.wiktionary.com](http://www.wiktionary.com)). Knowledge diffusion, therefore, can be defined as the act of dispersing knowledge. The concept of knowledge diffusion is not a new one. Thomas Jefferson considered it the most important component in the early stages of creating the United States. He saw it as the way to ‘preserve freedom and happiness’ (see <http://etext.virginia.edu/jefferson/biog/lj13.htm>). Companies have been managing knowledge for a long time [2].

Information technology alone is not enough to encourage the diffusion of knowledge [3]. Researchers have studied the effects of interactive learning in which the primary media for transferring information is via word of mouth [4]. Others [2] identified the critical component of knowledge diffusion as the linkage between people, while still other researchers [5] have discussed the importance of both weak and strong links—noting that weak links are important for non redundant knowledge transfer while stronger links are important for more complex knowledge. One author [6] has suggested that in times with a great deal of uncertainty, organizations that have strong ties to other organizations adapt better due to increased knowledge sharing and collaboration. Perhaps the ultimate idea is the creation of a knowledge sharing culture in which sharing each others knowledge will allow for the creation of more knowledge [7].

Creating a knowledge-sharing culture can be supported and enabled by information technology and a well designed information system.

Business schools, like many academic institutions, are challenged to stay relevant—both in terms of education and research. A quick review of the Financial Times, The Economist, or virtually any magazine that covers business schools leads one to conclude that schools are under constant assault by industry, journalists, and academics alike to justify their existence, relevancy, and effectiveness, given the rapid rate of change in today’s world.

Developing an effective way for diffusing knowledge can enable a university to build stronger links

between stakeholders, while also allowing for more timely input into the decision making process. Universities, like other organizations, have their challenges though.

### Problems in Higher Education

Universities would seem to be ideal places for knowledge diffusion. As Mikulecká and Mikulecky [8] pointed out:

- “universities usually possess a modern information infrastructure;
- to share their knowledge with others is very natural for professors and teachers in general;
- to acquire knowledge from accessible sources as fast as possible is a natural desire of students;
- there is usually a trustful atmosphere at universities: no one is hesitating nor (being) afraid of publishing or otherwise disseminating her or his knowledge.” (p. 2)

Higher education institutions, like other organizations, are challenged to use the information and knowledge they have to the overall betterment of the institution. Knowledge can easily be lost through the simple loss of an employee [5] or through indifference and a lack of desire to share.

Universities, perhaps more so than other institutions, typically have three silos—for the faculty, students, and administrators. These silos are often at odds with each other due to issues of grades, evaluations, tenure, salaries, financial resources, etc. [8]

Interaction and the transfer and sharing of knowledge are critical to the success of the university. Students acquire new knowledge through their interactions with faculty inside and outside of classroom interactions; faculty share knowledge with students and administration for reporting and improvement; the administration shares knowledge with key stakeholders including accreditation bodies.

Past research [5] has suggested that programs that encourage tie-building between organization members, coupled with technological systems that encourage interdependencies between people as well as reward systems that support the use of knowledge sharing can minimize the loss of knowledge.

A previous analysis of the adoption of an online evaluation system [9] identified a number of critical success factors (Table 1) necessary for the successful adoption of an online evaluation system at a college.

**Table 1.** Critical Success Factors

Executive Support
Key investments in IT
Upgraded PC's/software
Support staff
Collaborative culture
Sense of empowerment
Understanding of Student and Faculty Needs
Well defined process
Pilot testing
Faculty initiative
IT department support
Developmental funding

Regardless of the reasons, universities, like other institutions, are faced with rapid change and increased calls for more effective use of knowledge and resources. Developing a plan that allows for the successful adoption of a KM System can be critical to the success of the overall institution.

### The Specific Example of IUM

The International University of Monaco, (IUM) is a private business school located in the Principality of Monaco, near the border of France and Italy. It was founded in 1986 as the University of Southern Europe—an English language business school delivering bachelor's and master's degrees. After a period of financial difficulty, a new management team was brought in during the 2001/2 academic year to transition the university from a less selective school delivering a general business education, to a more selective, niche business school delivering top quality undergraduate and graduate degrees. Consistent with this repositioning, IUM has pursued an ambitious policy of continuous improvement in all aspects of its operations. The creation of a culture of knowledge management supported by a new information system was determined to be one of the critical success factors in helping the university achieve its strategic objectives. Consistent with this, new faculty and staff were hired to lead the effort. With a new team in place at IUM, ambitious but achievable goals were established that provided clarity and guidance for each member of the team. The common goal for the institution was the attainment of accreditation by higher levels, more relevant accreditation bodies including AACSB (The Association for Advancement of Collegiate Schools of Business), and AMBA (The Association of Master's of Business in Administration). These bodies were considered more relevant as IUM is a business only University in a unique location. Given the rapid increase in the number of European

business schools offering programs in English, IUM was forced to redefine itself. This included changing the name of the university to more closely identify it with the Principality as well as a focus through the development of specific programs and research centres on what it means to be a university in Monaco.

### **Development of an Information System**

The impact of the new management team was felt almost immediately, and with enrollment increasing rapidly, as well as the additional data required by AMBA and AACSB, the tools that existed in the university had to be replaced rapidly. To do this, the work procedures used in the legacy system had to be identified. Accreditation requirements meant retaining records of all students—whether they took one course as an auditor (not for grade or credit) or in pursuit of a degree. The development of a new system also allowed the university to identify other sources of data that had been developed outside of the legacy system. To be able to implement the new system, the old system had to be analyzed, the new system designed, and then implemented. This included updating and in many cases creating internal practices and work flow procedures. The existing system had a restricted data set which included more than 35000 records about courses, grades, and students but the relational scheme was no longer sufficient for the increasing needs of the university.

The initial analysis led to designing a new information system from scratch, using lessons learned from the analysis of the previous system and the experience of the employees, while keeping the university's goals of creating a knowledge sharing culture and attaining AACSB and AMBA accreditation in mind. The new design represented an opportunity that allowed for the development of a framework for research on the knowledge flows throughout the organization. This also included the proactive use of data to assist the administration, faculty, and staff in tracking and assessing the performance of all stakeholders (i.e., students, faculty, and staff). Features of the initial implementation of the new information system included the creation of a data warehouse which included course, program, and curriculum folders in the university network, with predefined relationships established which allowed faculty and staff to track student and faculty performance over time in a real time manner with a richer data set. No longer do program directors have to search several databases for student information; it all resides in a single, comprehensive location with the most significant

relationships already established. To ensure compliance with accreditation standards, new relationships including standardized grading and attendance policies allow for deeper analysis of student performance and enable improvements in tracking student progress towards their degrees.

The main objective of these standardizations and centralization is the sharing of knowledge, with the perspective that sharing knowledge creates [10]. And as Droege and Hoobler [5] have noted, sharing knowledge can strengthen ties, which in turn, allows for the sharing of even more complex knowledge. In a time of rapid change and uncertainty, strong ties, and dealing with more complex issues are both necessities for maintaining a competitive advantage.

### **Implementation Phases**

The implementation of the University Information System took place into 3 phases. The first phase involved the designing and implementation the core of the new system.

#### *Phase 1: Designing & Implementing the Core*

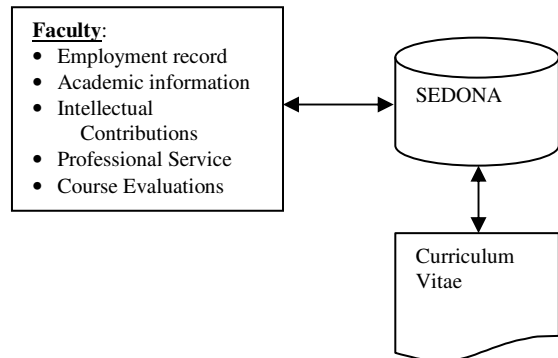
Using the existing system (in Access 2000) as a frame of reference, the analysis of the needs and the design of the new framework took place in 2002-2003. In 2003 the initial proposal was made to the executive board, defining the boundary of the system, as well as near term and future enhancements (e-learning, extranet, etc.) The design and implementation took two years before it was finally put into use in the fall of 2004. This initial implementation was done in parallel with the old legacy system to ensure a smooth transition. In winter of 2005, the new system was fully implemented as all data and processes and procedures were switched over from the legacy system. After an initial period of concern primarily due to unfamiliarity, feedback from professors and administrators has been overwhelmingly positive, additional features has been added following professors/staff advices and comments.

#### *Phase 2: Compliance with Accreditation*

The second phase of implementation involved the evolution of the system so that it would support the reporting and compliance requirements of the various accreditation bodies.

In the process of pursuing AACSB accreditation, new requirements have been identified and implemented, including the initial adoption of a web-based system

for capturing faculty development information (Sedona located at <http://www.sedona.bz>) as portrayed in Figure 1.



**Figure 1.** Sedona & Faculty Data Integration

This system was originally designed to keep track of students' data, credentials, and academic results to streamline the process of following students performance. It has evolved into a system that integrates specifically with the AACSB Accreditation processes as AACSB requires a certain set of information and data related to faculty performance and data. This includes papers published, conferences attended, professional development activities, service, and teaching. IUM has further developed the IVITA module which is based on the SEDONA system and which can help validate faculty

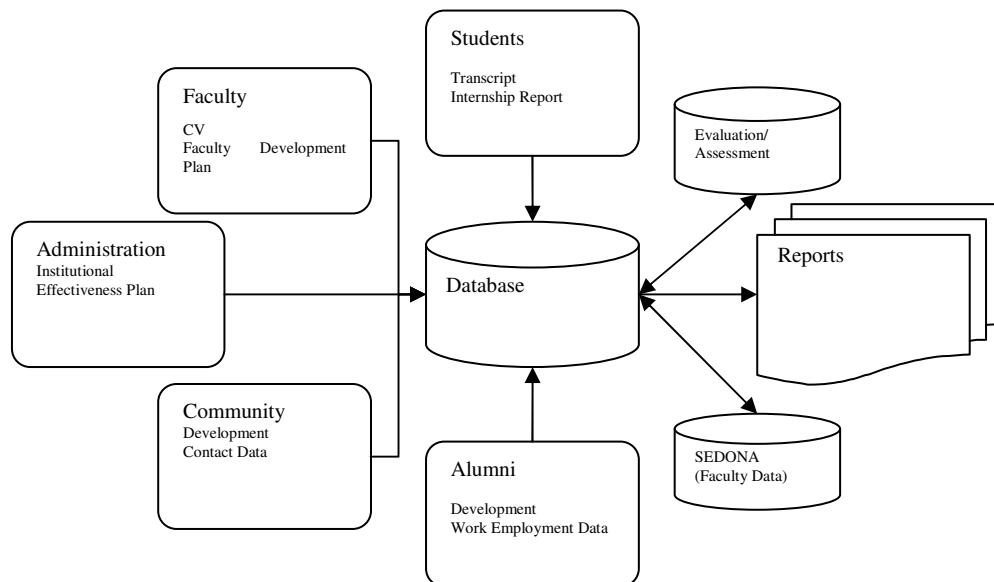
credentials. Together, these two systems (IVITA and SEDONA) keep track of all faculty academic information. Data and documentation are available through the SEDONA system, linked to our Intranet system, and available on IUM web site.

A recent enhancement included the addition of student evaluation of faculty. This module was added in June 2006 and enables faculty and administration access to all student evaluations from 1986 onwards. A future enhancement will integrate the IVITA, SEDONA, and student evaluation modules so that faculty and administration will have instant access to a full data set of faculty performance, which can then be printed out as a part of the annual Faculty Development Plan.

*Phase 3: Beyond the Core and Compliance*

Phase 3 will evolve the IUMA system so that it will have a 'real time' reach—gathering and disseminating stakeholder input, including online assessment, virtual classes, and a tool to try to quantify learning outcome of the students.

The E/Virtual classes will be necessary to have a complementary online module for normal classes, and to allow Executive MBA students to remain connected to IUM between sessions (typically 2 to 3 months).



**Figure 2.** A Conceptual Level View of a Higher Education Information

Further enhancements will also include the use of student evaluations of faculty, as well as possibly, faculty evaluations of students (including examinations, uploading of documents, etc.). This platform can further be used to support faculty and student research initiatives. Table 2 highlights a number of benefits of using web-based surveying and online evaluation techniques. The advantages of using online systems are clear and compelling: Response times can be reduced from days and weeks to minutes and hours [1]. Other benefits include the ‘immediate availability of data for analysis and reporting and more extensive qualitative responses from students to the open-ended questions.’[11] This was supported by other studies [12], [13]. An additional benefit to web-based surveying in that the researcher can create adaptive surveys in which the software can present audio, video, and graphical images and can also adjust the sequence of questions based on the users’ responses [14].

**Table 2.** Benefits of Online Evaluation Systems

Speed
Time
Accuracy
Adaptability
Anonymity
Data Collection
Data Evaluation
Reach
Ability to personalize

Further benefits include the possibility of real time interactions with a diverse (geographically) group of respondents and information servers [15]. Results can be tabulated immediately, and interventions can take place to modify questionnaires, add new links, stop the project altogether. Online evaluation systems allow faculty to make modifications to courses frequently, which may result in a better educational experience for students [13]. And as bandwidth increases, so does the ability to transmit audio and video, opening up the possibility for real-time feedback from respondents via focus groups or interviews [15]. One set of researchers found that as students could complete the evaluation on their own time, they tended to provide more comprehensive qualitative comments [12].

**Other Uses of Online Evaluation Techniques**

Besides student and faculty evaluations, there are many other needs for assessment at universities that support both institutional and accreditation purposes (see Table 3). Career development needs include

gathering data about student’s interests, internships, and past work experiences; potential employer’s needs; graduate career development and changes; the program directors need input for the curriculum review process; the enrolment management team gathers data about prospective students; and faculty may use the tools for research.

**Table 3.** Academic Uses of Online Surveys

Student feedback
Feedback from potential employers
Enrolment management
Student evaluation of faculty
Faculty assessment of student performance (i.e. quizzes, tests, exams)
On line Cross evaluation of students and faculty perception of learning outcomes
Career progress of alumni
Curriculum review & Program Assessment
Market research

The key is to be able to pull data together efficiently, and to then produce both digital and paper-based reports that assist the university in achieving its goals, while also having the data necessary to show compliance to the various government education departments, accrediting bodies, and other stakeholders who require periodic reports on the overall progress of the institution. The biggest challenge lies in the development and implementation of a system that is easy to use, reliable, and produces the desired results.

**SUMMARY**

The successful implementation of a new knowledge management system has been a critical component in the renewal of the International University of Monaco. A well designed information system, based on the sharing of knowledge within the organization has allowed the management team to not only develop a process of continuous improvement, but also empower employees with more relevant and timely information that allows them to do their jobs better. This includes student evaluations, program and course information for the program direction team; students, alumni, employer, and potential student feedback (that assists in marketing and curriculum development; information about the faculty as both self reported (using Sedona) and as derived from student evaluations); registration and financial information that allow the executive team to manage the overall institution as well as to plan for the future; and finally, reporting that taps into the IUMA data warehouse that enables the university to

generate the data, information, and reports necessary for compliance with AACSB, AMBA, and other accreditation bodies. While the actual development of the system was the result of a lot of time and energy by a few dedicated people, the International University of Monaco also had the right combination of critical success factors that enabled the successful transition from a very limited, legacy information system. Executive support, coupled with the necessary funds, and a collaborative culture that encouraged experimentation helped ensure success.

### FUTURE TRENDS

Future uses include a full implementation of web-based surveys and online evaluations that will increase the speed at which information can be processed and analyzed. This will enable students, faculty, and staff to receive feedback more quickly and in greater detail. It also helps assist other administrative departments in surveying alumni and other institutional stakeholders to help university continue to grow. This will help the college gather meaningful data that supports the institutions mission and also accreditation and marketing processes.

Future efforts that use additional media—including audio and video, plus more adaptive surveys—may open up new opportunities for increasing the use of such systems. The key technical point for researchers to remember is that not all stakeholders have Internet access, and therefore the population is a subset of the whole. Total dependency on online systems can lead to response bias by excluding critical input. Knowing the capabilities and limitations of the institution and the technology will allow institutions to determine the level of utilization of an online evaluation system, while also increasing the speed at which data is gathered, and feedback provided.

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