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The Use of Groupware in the Reengineering of Business Processes
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The Use of Groupware in the Reengineering of Business Processes

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Abstract:

The principles and business practices of reengineering and other change management strategies have been around for decades. More recently, practitioners have stressed the central role of information resource management and information technology enablement in achieving institutional reengineering objectives. This session takes an “in the trenches” view of these efforts, considering project management, change team composition, process modeling, and the performance metrics for both customer service enhancement and operating cost reduction. The session then considers in some detail the use of various collaborative I/T tools, including: electronic mail, electronic conferencing, and workflow-enablement software, as an integral part of these activities.

Richard M. Kesner, Chief Information Officer at Babson College and President of RMK Associates, Inc., will begin by briefly detailing a reengineering process model and its I/T underpinnings. To this end, he will address the institution’s need for a formal information architecture and I/T infrastructure. With these capabilities in place, the institution will be positioned to move forward with a major change initiative.

Mr. Kesner will then apply this model as a lens to view Babson College’s transformation efforts. This case study will include a discussion of the role of Lotus Notes as a collaborative tool; Banyan Beyond Mail, Action Technology Action WorkFlow, and Microsoft Visual Basic and SQL Server as tools for building informed and automated business processes; and ABT PowerCampus, US Lan Fundmaster Financial Software, and Sequitur Admission System as workflow-enabled applications. The following pages summarize the session’s findings.

The Crisis in Higher Education - the Need for Change:

Many higher education leaders in the United States now believe that our colleges and universities face a major crisis. The components of this crisis are clear to us all:
• slow job growth and stagnant income levels.

• tuition growth at levels greater than the rate of inflation.\(^1\)

• a rapidly growing gap between all sources of student funding and the capacity of students and their families to pay.\(^2\)

• a radical change in student demographics, requiring higher costs to recruit, educate, and support.

• a Federal financial aid structure under siege by the government for what it costs and criticized by the public because it does not meet current need.\(^3\)

• the more general loss of public trust in higher education.

• a questioning of the value and need of traditional higher education, encouraging the growth of work place alternatives.

Given these circumstances, it is clear that collegiate institutions cannot continue to operate as they have in the past. They must change or cease to exist. According to Myles Brand, President of the University of Oregon, colleges and universities have two options:

First, members of the academy can debate possible reforms and then cautiously pursue them, which is a tack many of us prefer. Or second, we can challenge one another to think expansively and to debate bold new directions in higher education - directions that break from conventional paradigms in ways that range from creative to radical.\(^4\)

\(^1\)Operating costs and the tuition and fees continue to rise. The mean and median undergraduate tuition and fees at independent institutions in Massachusetts rose over 11% each from 1991 to 1993 alone. Coupled with that, current fund expenditures for Massachusetts, New England, and the United States rose 93%, 93%, and 89.9% respectively from 1983 to 1990 while revenues decreased 90.1%, 89.4% and 86.4% respectively. The Chronicle of Higher Education, the New York Times, and many professional journals regularly report on the growing gap between the cost of a college education and the ability of the typical U.S. family to meet these financial requirements.

\(^2\)For example, the amount of unmet need for undergraduate students at Babson College has risen from $73,000 in 1991/2 to a projected $851,000 in 1993/4 (an increase of over 1000%). If Babson were to fund this gap, it would have an immediate impact on revenues because 93% of all financial aid dollars are currently funded from general revenue (i.e. student tuition dollars).

\(^3\)Nationally, a $2 billion deficit in the Pell Grant Program has reduced the chances for federal aid and hence a critical component in college funding for many students. Furthermore, between 1986 and 1992, the estimated total state grant aid awarded by Massachusetts dropped from $66,974,000 in 1986 to $39,989,000 in 1992. Here at Babson the financial aid budget underwritten by tuition and endowment dollars has grown by approximately 375% between 1986 and 1992. The College’s ability to fund its financial aid program in light of other major strategic initiatives has diminished while the student need for financial aid has radically increased (from 32% of all undergraduates in 1989/90 to 49% today).

Babson College faces the same obstacles as the rest of higher education. Moreover, the College has adopted a long-range strategic plan that will rapidly propel them into the forefront of business education. This approach has and will continue to require significant resources - both human and financial, far exceeding the institution's current means. For example, the remaking of the Two-year MBA program has positioned Babson College at the leading edge. The delivery of this program costs considerably more than its predecessor. Similarly, the College will need to invest more heavily in its undergraduate program as it is redesigned. Though both of these efforts are critical to the immediate and future viability of Babson as an institution, neither will, in and of themselves, generate significantly increased revenues to cover the added costs of development, implementation, and ongoing support. At another level, the College requires full-time faculty, facilities, information technologies, and library resources far beyond those that complemented past modes of program delivery. These enabling services further raise the cost of overall operations.

In quantitative terms, the College currently requires nearly an additional $1.4 million dollars annually to develop and run its new educational programs. Capital, information technology, and library requirements are presently underfunded by approximately fifty percent (50%), another $1.2 million dollars annually. These figures cannot be offset by a growth in tuition and fees. In fact, to be competitive today, Babson is committed to annual increases in revenues pegged to the consumer price index. Furthermore, the College plans to reduce undergraduate enrollment to approximately 1600 by 1997/98, in line with the capacity of the institution's present and planned facilities. In short, while essential costs are going up dramatically, Babson lacks the ability to generate significant added revenues.

Finally, since the College is dependent upon tuition dollars and will continue to be so, Babson must maintain its ability to attract and retain high quality students. While the redesign of both the graduate and undergraduate programs will address the academic requirements of our customers, recent data indicate that the delivery of student-related business services do not meet their needs. Since these

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5 Most institutions of higher education rely upon endowment income as well as tuition dollars to cover their operating costs. Lacking a substantial endowment fund, Babson College must rely largely on its annual revenues to pay for both current operations and future program development.

6 Graduate Dean Tom Moore has documented nearly a doubling in faculty contact hours in the new MBA program, pushing the costs of this program beyond his limited strategic development fund. Steve Schiffman, the Undergraduate Dean, has begun the planning for a new curriculum. It is clear from the already-established undergraduate cluster program that anticipated undergraduate teaching changes will also require substantial added resources.

activities are central to student perceptions of the value of the Babson experience, the College must address these issues as part of its marketing and business strategies.

**Developing an Action Plan:**

In the spring of 1993, Babson College's President, William F. Glavin, appointed a Task Force of senior administrators, faculty, and reengineering experts to consider the role that a reengineering process might play in the development and success of the institution. On December 23, 1993, this working group reported back to the President, recommending the initiation of a reengineering effort that focused upon the enrollment process (i.e. the delivery of student administrative services, from initial inquiry through graduation and including such processes as admission processing, registration, student billing, and financial aid packaging). In making this recommendation, the Task Force emphasized the goal of significantly improving the quality of service delivered to undergraduate and graduate students. The report indicated that this goal was to be achieved through the radical redesign of said services while reducing their overall cost to the College.

On February 4, 1994 and at the recommendation of the Reengineering Task Force, President Glavin appointed a Reengineering Design Team (RDT). This group included: Richard M. Kesner, Chief Information Officer, as chair; Madge Lewis, Graduate Registrar, as co-chair (and as the designated Director of the reengineering implementation process); Connie Bosse, Associate Dean Undergraduate Studies; Keith Conant, Associate Director of Financial Aid; Carol Leahy, Systems Analyst; Mary Rose, Assistant Dean of Admission; Peg Abbate, Administrative Assistant to the CIO; and Gerry Shaw, consultant (and the former Vice President of Student Affairs at another Massachusetts college). Kesner, Lewis and Shaw were assigned to the RDT on a full-time basis, while the remainder of the team devoted approximately 40% of their time to RDT business.

As set forth in the Reengineering Task Force's *Case for Action* and subsequently endorsed by the College's President and Cabinet, it was the assignment of the Reengineering Design Team to develop a detailed plan for the renewed delivery of student administrative services, i.e. all of those services that complement classroom academic experiences, including: admission, financial aid, registration, student billing, student loans administration, academic planning, field-based learning administration, career services, and so forth. This document was to present descriptive scenarios for a desired state, a plan for their attainment, and operating computer system prototypes.

The RDT reported back to the President and Cabinet (the College's executive management team) on June 30, 1994. At a Cabinet retreat, scheduled from July 12 to 14, 1994, the RDT presented its findings and demonstrated prototypes for a new student registration and academic planning system, a student information system,
a student financial services and billing system, a student opinion survey system, and an electronic course catalog.

**The Role of Information Resource Management (IRM):**

Throughout the reengineering design process, the RDT operated with an understanding that to succeed in this endeavor, the College required a completely new set of information tools. The actual data was already at hand but in a wide variety of inconsistent and largely inaccessible formats. To succeed in reengineering, the College needed an I/T infrastructure that afforded access to authorized users at any time and from both on- and off-campus locations. The computer hardware and software components of this solution were to facilitate broader information access.

At the start of the change process, a considerable amount of time around campus was invested in searching for information, rekeying data already stored elsewhere, verifying the quality and accuracy of information, checking the status of documents flowing within processes, and so forth. In the view of the Reengineering Design Team Chair, a radically different approach was required:

*To address this situation, Babson must develop a single, integrated information database that: (1) captures all relevant customer data once, (2) allows for and indeed prompts the information owner to update and/or validate his/her records, (3) provides easy access to authorized users, (4) affords the capability to ask questions, develop scenarios, and conduct trend analysis from the data easily and quickly, (5) affords multiple views of the data in its most current and accurate form, and (6) provides access any time and from both on- and off-campus locations.*
As depicted above, the demographic data view would be created by the student initially with system-driven reminders to keep this record current. Once created, any authorized person on- or off-campus could access this demographic information or a portion of it to service the customer. Similarly, the academic data view would come about as a function of information fed from automated systems (e.g. academic records and degree audit) as well as from actual data entry (e.g. faculty grades and advisor comments). Given the information-intensive nature of the higher education experience, each student would have many different views in that student's virtual (i.e. electronic) folder.

Investing in Information Technology Enablement:

To achieve the aforementioned information management objectives, Babson College required significant changes to its I/T systems and infrastructure. Starting in 1992, the College moved towards the implementation of a state-of-the-art electronic information network, based upon client/server technologies with these needs in mind. The new network (a.k.a. GlobeNet) employs an optical fiber backbone, connecting all buildings on campus and running the Banyan Vines operating system. A variety of servers run both old (so-called legacy) applications and new client-server-based applications via GlobeNet. On the client side of this equation, the College has replaced old desk-top units with standard 486 personal computers, running Windows and the Microsoft suite of office automation tools.

The overall network architecture conforms to open industry standards and will allow the College to move quickly, flexibly, and economically towards its new
information systems and services objectives. This environment includes file and printer sharing, an electronic mail system that works in conjunction with its standard office automation tools, and cooperative groupware, such as Lotus’s NOTES and Action Technology’s Action WorkFlow. Furthermore, the College has invested in the development of an information architecture as forward thinking as its network design.

The information architecture plan is built around a data warehouse driven by a Microsoft SQL Server relational-database engine. At the present time, the College's legacy systems feed the data warehouse, but over time, new systems - some purchased for their outstanding client/server performance and others developed in-house - will replace the existing transaction systems. End user access to College data will come less frequently from these systems and more often from the data warehouse via a Babson College-built front end and the employment of off-the-shelf query tools, such as Microsoft Query.
Like the College's office automation tools, these front ends will employ an easy-to-use, point-and-click, graphical user interface (GUI). Thus, all of the information systems will have the same look and feel, facilitating cross-functionality and training. Through this strategy, Babson may replace transaction systems without affecting the end user's information views and business processes. More importantly, as the College reengineers, it will not be restricted by the limitations of functionally-focused information systems. The data warehouse provides the flexibility needed to fashion new information views quickly and economically as business processes change.

**Babson’s Groupware Strategy:**

The success of Babson’s reengineering efforts depends upon the timely delivery of effective and efficient I/T tools. Some of these products, particularly Lotus Notes and Banyan Beyond Mail, play a critical role in the actual change management process by facilitating information sharing and collaboration. Others, like ABT’s PowerCampus, US Lan’s Fundmaster, and Sequitur’s Admission System provide the College with state-of-the-art, workflow-enabled, client-server software. Still other products, including Microsoft’s SQL Server, Access, and Visual Basic, afford both campus I/T specialists and end users the means to present, capture, share, and analyze information in line with the operation of reengineered business processes.

Thus, as part of its change management strategy, Babson has positioned itself to leverage these technologies as part of a larger information architecture plan. Simply stated, this design separates the access and operation of transaction-based applications from customer views of data. It also offers a powerful and efficient family of workflow-enabled products (a.k.a. middleware) to informate and automate processes. The following graphic summarizes this architectural design:
The transaction systems at the bottom of the diagram represent products that are used, owned, and controlled by specific service providers, such as Accounting, Admission, and the Registrar. The data from these systems reaches the end user (students, faculty, and staff) via a complex **middleware** layer. The operational data store (ODS) serves as the repository for current data from transaction systems and the data warehouse serves as its cognate historical repository.

**Groupware** plays an integral role in the delivery systems built into this design. For example, stored procedures within the ODS and data warehouse may be triggered by specific events (e.g. the closing of an accounting period) or a specific date (e.g. the end of registration add/drop). These triggers automatically release formatted data to the end user (e.g. financial reports, class rosters). At a more sophisticated level, an electronic agent or “performer” will look for certain conditions to exist and will then take action as governed by its program. For example, an agent will periodically remind faculty to submit their grades and students to pay their outstanding account balances. Once the faculty member or student has fulfill his/her obligations, the messaging will stop.

The architecture’s workflow-enabled design is most manifest in two other system components: **Workview** and **BP Reporter**. Workview is a user front-end to **Action WorkFlow** that lists all the work in an individual performer’s work queue. The **Workview** product identifies the type of response required (a.k.a. the allowable act(s)) and the priority status of the task. This tool will allow service providers to...
better manage their daily assignments as it expedites action within business processes. The *BP Reporter* monitors processes, service providers, and process conditions of customer satisfaction. For any given process, it identifies all activity in terms of specific performance metrics. This tool provides a graphical representation of processes team performance along with a drill-down capability to ferret out the root causes of performance problems.

The last major component of the Babson information architecture design is electronic mail. We chose our e-mail product (Banyan *Beyond Mail*) because it possesses both an electronic forms utility and a workflow enablement capability. Babson is integrating the delivery of most information services through this tool.

With Lotus *Notes* databases, the Babson *Worldwide Web* utility, and a number of workflow-enabled transaction system, this I/T environment is now ready for the new business processes emerging from the College’s reengineering efforts.