

# Technology And Academia – An Update

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*Cara Noferi and Eric Teicholz*

*This case study article is the result of a survey of innovative uses of FM technology in higher education. Universities continue to be at the forefront of using the Internet, wireless communication and integrating FM applications into other enterprise software such as human resources, financial and purchasing systems.*

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## **1 OVERVIEW**

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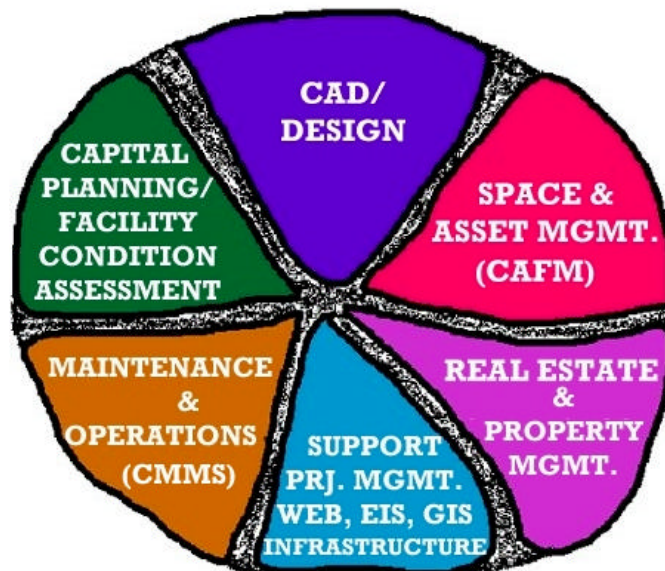
With increasing demands for justifying and securing funds for facility renewal, as well as maintaining the operation of their millions of square feet of physical space, universities and colleges have increasingly made large investments in their FM information systems. In the past, because of their large databases, unique reporting needs and complex IT infrastructure, higher educational institutions typically developed or purchased proprietary in-house systems to support facility management functions. Now with technology that readily allows open databases, Internet reporting and flexible integration with legacy systems, the trend has been to increasingly deploy customized COTS software packages.

### CAFM Technology

Facility Management is comprised of a wide range disciplines, from planning, design, construction management, project management, space planning, real estate & leasing, property management, building and operations management, and capital planning. The acronym 'CAFM', coined in the '70's, originally referred to space and asset management systems that had an integrated CAD component. But now CAFM has become a common catch-all term for the technology that supports not only space and assets, but the wide range of FM business functions which share common data and processes. As figure 1 depicts, CAFM technology can be broken into six primary segments:

- Space & Asset Management - (still widely referred to as CAFM Systems) for Space Inventory, Asset Inventory (e.g., FF&E), integrated CAD, occupancy information, space planning and analysis, stacking and blocking, and move management.
- CAD - Computer Aided Drafting for planning and design, basic links to external databases.

- Capital Planning/ Facility Condition Assessment - tracking condition and deficiencies of buildings (e.g., roofs, structural, mechanical systems, etc.) and life cycle costs for renewal.
- Maintenance & Operations (CMMS); work order management, preventative maintenance, stock/inventories, crew scheduling, etc.
- Support Technologies, a miscellaneous grouping for functions that support and integrate the other FM specific categories. Examples include project management, document management, finance and accounting, Web-based applications such as Extranets and e-procurement, reporting tools, IT Infrastructure, and office support tools such as email, word processing, and spreadsheets.
- Real Estate & Property Management (not typical for universities, but more so for corporations that lease out owned property) - tracks information on property portfolios with tenant and lease administration, transaction management, financial modeling, and work management functions.



*Figure 1: Various functions of CAFM Technology are becoming seamlessly integrated with new Internet technologies.*

Below are some recent CAFM case studies from universities that have successfully combined FM technology with business processes to arrive at innovative solutions that meet their unique and increasing demands for information.

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## 2 CAPITAL PLANNING AND PROJECT CONTROL - UNIVERSITY OF MASSACHUSETTS AT AMHERST

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The early 90's brought on a revitalized funding commitment for capital projects at the University of Massachusetts, Amherst. The Facilities Planning Division, headed by Director Jim Cahill, was formed out the existing Physical Plant Division as a separate business unit in order to meet the unique requirements involved in managing large scale renovation and construction projects.

At UMass Amherst, the Facilities Planning relied heavily on Physical Plant to provide administrative and operational support for functions such as MIS, timekeeping, payroll, recharge and work management. As more engineering and architectural staff were hired to handle the increase in workloads (currently there are over 200 active projects with \$10-15 million spent annually), new PM processes were being developed every week. Desktop databases were independently developed to track the additional information Facilities Planning required for functions such as contract administration, project funding and expenditures, project estimating and staff scheduling. Management reporting became a manual and time consuming effort. Facilities Planning made an important decision early on to step back and develop a strategic plan not only for capital planning but for their technology and information needs.

*"It is critical to have reliable information readily available... We compete for funds with several entities and have to defend our needs....The battle for adequate funding is never ending." says Jim Cahill.*

The first priority was to be able to have the necessary information to secure the funding for capital projects. UMass conducted a campus-wide facility assessment audit for its 400+ buildings which comprise more than 9 million gross square feet. The database system, *VFA.facility* from VFA, as well as the assessment approach *"helped us develop a clear, concise picture of our facilities conditions and accumulated liability, and played a tremendous role in obtaining funding to address our facilities issues...we are poised for the long-term planning horizon," says Jim Cahill.*

The second priority was the to implement a comprehensive work management program that could support both the operational aspect of project management as well as the financial component. Yvonne Kielb, Manager of Business Operations, took on the management of the year long effort with the help of Graphic Systems, Inc., a FM technology consulting group. Existing business processes, systems, data and reports were identified as a starting point in developing system requirements (see Figure 2).

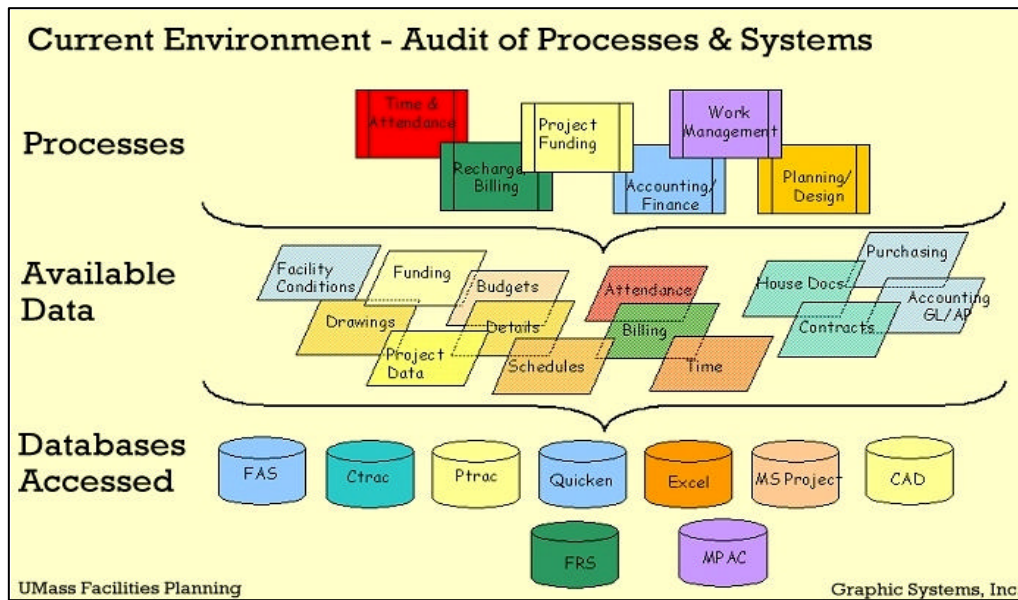


Figure 2: Findings from the technology audit prior to implementing project control system.

Commercial project accounting and management systems were evaluated, and Deltek's Advantage software was selected as the best fit. Project methodologies and data standards for the Facilities Planning engineering and architectural groups were developed; labor codes, funding sources, project accounts, customers, vendors and consultants were identified. Existing data was converted and imported into the new system, some custom functions and reports were developed, administrative staff was trained to manage components of the system, and all 50 staff members were briefed on using the electronic timesheets.

Now, after several years in operation, the wrinkles have been ironed out and Facilities Planning is reaping the benefits. Management is able to quickly generate monthly finance and funding reports, weekly project status reports, and readily access project data for budgeting new work and analyzing project effectiveness. Customer service has improved considerably with monthly project statements,

something the customer never saw before. Among administrative staff productivity has increased as well as feeling of pride and accomplishment, brought on by contributing to a successful and vital component of the business.

According to Kielb, several key factors contributed to the success of the project:

- Formalize gap analysis, involving users;
- Understand that individuals have different levels of learning;
- Have a dedicated project manager for responsible for implementation;
- Use consultant for process and system documentation; and
- Recognize the investment over the short and long term.

Kielb adds, *"The system implementation enforced a needed structure for our expanding business operation. Whereas previously we had fragmented project information -- in individual folders, on spreadsheets, in someone's head -- we now have readily accessible information for each piece of the process, allowing us to closely monitor communications, commitments, budgets and actuals."*

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### **3 LEGACY SYSTEMS INTEGRATION WITH MAINTENANCE & OPERATIONS MANAGEMENT - IOWA STATE**

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In the late 1990's, Iowa State University was forced to decide between developing a new Y2K-compliant work management system in-house or investing in a commercial package that could integrate with the University's IBM DB2 legacy systems. Besides being less costly, the assurance that the system would be up and running prior to new millennium was reason enough to buy from a commercial vendor, according to Chris Ahoy, Vice President of Facilities. The project team, headed by Mike Hamilton, Manager of Computer Support Services, included all areas of Facilities Planning & Management as well as other business units including Purchasing, Central Stores, Human Resources, EH&S, Controller's Office, Transportation Services, Treasurer's Office, and Data Processing. The team conducted a comprehensive business requirements analysis, evaluated commercial packages and sent out a lengthy RFP to over 40 vendors. All of the vendors selected as finalists had robust work management systems, open database connectivity and good user interfaces. However they decided to select FAMIS from Prism Computer Corp. because, while all the vendors assured that their native Oracle systems could interface with the legacy DB2 systems (such as Purchasing ,Accounting and Space), only Prism performed up-front data mapping and testing to actually prove it.

The team had about 15 months of planning and learning to meet the January 1 implementation deadline. The toughest challenge for the technical team was the learning curve involved in not only becoming proficient with Oracle but understanding the facility management system. Communicating with Prism users from other universities helped a great deal. In fact, Iowa was able to model much of their implementation effort after University of Minnesota who was about 2 months ahead in terms of a similar implementation. There were many team information-gathering workshops for understanding business processes and developing functional requirements and integration specifications for the systems modules which include accounting & finance, equipment rental, key control & inventory, material stores, payroll, preventive maintenance, purchasing, capital planning and work management. They currently have dynamic look up tables that read the DB2 databases for accounts, employees and spaces. *"Working together on the various task teams has provided many positive ramifications. It has provided a nucleus and given a variety of people the opportunity to work together. It also has helped us learn more about who we are and what we do, "* says Hamilton.

With over 200 users, the system has brought about substantial increases in efficiency, moving away from paper and manual operations towards electronic information and automated processes, resulting

in better service. But according to Ahoy, the University still has a ways to go before they realize the full benefits of the software. Replacing their existing legacy space system with the FAMIS space management module will be done in the near-term future. They are also looking forward to installing the new Internet version of Oracle 8i and phasing out of the client/server computing environment into a Web-based infrastructure. The Data Processing group is currently developing an on-line requisition process that will integrate the material/stores module with the University's procurement system.

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## 4 E- PROCUREMENT - MIT

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Several universities have been utilizing e-commerce Internet technology for such functions as class registration, sporting event ticket sales, and even tuition payment processing. And although it is not a function of an FM business unit, MIT's Internet procurement system for lab and office supplies and computers provides a clear model of what's likely to follow for the Maintenance and Operations procurement function in many organizations.

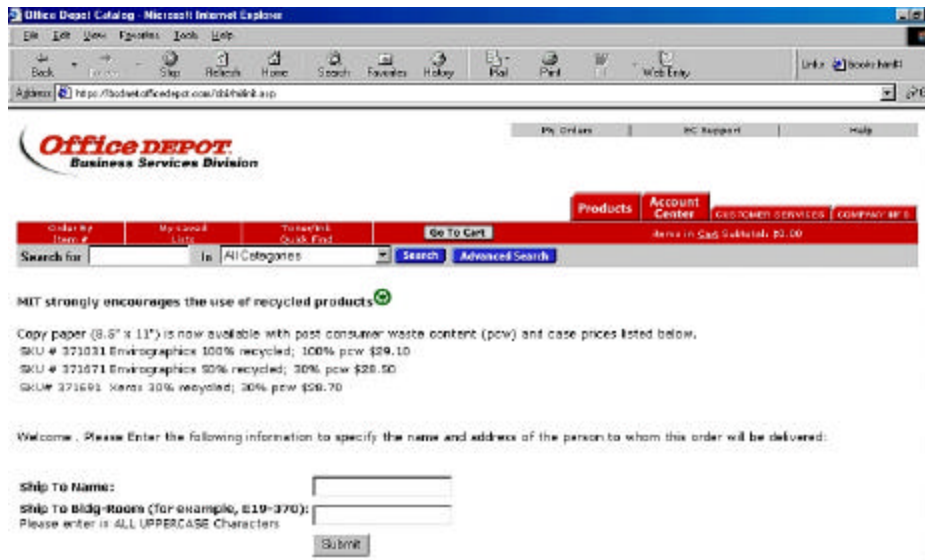


Figure 3: With a special digital certificate, MIT faculty and staff can browse the vendors' catalogs with special pricing, fill out a shopping cart and submit their order.

In the past year many vendors, like *MRO.com* and *Datastream/iProcure.com*, have embarked on similar efforts providing the ready-made solution for corporations. But, as MIT's Linda Rappaport suggests, the real incentive is not necessarily having just a Web-based purchasing process. "The project was heavily driven by business users - Procurement in particular. They were looking to leverage the University's buying power by partnering with vendors," says Rappaport.

When the project started about five years ago, part of the original design was to provide some kind of on-line catalogue of product inventories and integrate it with their SAP financial accounting software. There were many business users initially involved, including Procurement, Property & Audit, Office of Sponsored Research (consulting on purchases for grant research), Accounting, administrative staff, faculty, vendors and Information Systems. Planning efforts for business process and learning new technologies took between 12-15 months, a good chunk of the total project time.

Their online system is called ECAT, short for Electronic CATalog. With a special digital certificate, faculty and staff can browse the vendors' catalogs with special MIT pricing, fill out a shopping cart and submit their order. They currently have partnerships with four vendors including Office Depot for office supplies (see Figure 3).

The system has received a favorable response with the campus community. *"Students and faculty like to be able to place orders anytime, anywhere. If someone needs lab supplies at 1 am, they can order it instead of having to wait until 9 am the next morning and walk over to procurement,"* says Rappaport. Besides being the preferred method for procurement (70% of Office Depot orders and 85% of computer orders are placed online), Rappaport adds that *"ECAT has allowed the Procurement group to focus on building relationships rather than on processing orders."*

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MIT announced earlier this year that it plans to offer all of its course offerings free to everybody via the Internet. This \$100 million, 10-year initiative will include all aspects of course material including problem sets, exams, syllabuses, video lectures and so forth. Viewers will not get credit for participating. This model, called OpenCourseWare, for content distribution is very different from most other schools (see case study below) that are seeking to sell content through the Web.

**About the Authors:**

Cara Rodgers (<mailto:crodgers@graphsys.com>) and Eric Teicholz (<mailto:teicholz@graphsys.com>) work at Graphic Systems, Inc., a facility management/real estate technology consulting company. Teicholz has just completed his 10<sup>th</sup> book on FM, *Handbook of Facilities Design and Management* (<http://www.graphsys.com/html/books.html>), published in January of this year by McGraw-Hill.