Chapter 14
Leading-Edge Technologies and Facility for Competitive Higher Business Education

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14.1 Introduction

The main purpose of this paper is to present how a new building project with an externally traditional architecture, was developed, through a purposeful design and construction process, into an integrated, innovative environment for competitive higher business education.

The authors briefly review the main characteristics of the Mason School of Business at the College of William and Mary in Williamsburg, Virginia. Then they discuss the information gathering activities and program statement, which served as the basis of the architectural and engineering design. They explain the building project organization and decisions about design features that foster integration of curriculum initiatives and advanced learning technology, along with a much greater and purposeful socialization of faculty, staff, and students.

The paper should offer valuable information to all university leaders and administrators, but especially those who are considering, or are already in the process of acquiring a new facility for their institutions.

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14.1.1 The College of William and Mary

14.1.1.1 History

Founded in 1693, the College of William and Mary is the second oldest university in North America. The "alma mater" of the United States, William and Mary nurtured the minds of those who inspired the American Revolution and founded the nation, among them Thomas Jefferson and James Monroe. Dedicated to this philosophy and committed to limited enrollment, the College provides high-quality undergraduate, graduate, and professional education that prepares students to make significant contributions to the Commonwealth of Virginia and the nation [See also (Brown and Lord 1999)].

The College of William & Mary is one of the eight schools known as "Public Ivies;" it was named the sixth-best public university by U. S. News and World Report in 2009. William and Mary has an enrollment of 7,500, of which some 5,500 are undergraduates, and 2,000 are graduate and professional students.

14.1.1.2 Administration and Finances

The College of William and Mary is a public university in the Commonwealth of Virginia, governed by a Board of Visitors. The Board, composed of 17 members, is appointed by the Governor of the Commonwealth to serve the College.

Reporting directly to the Board of Visitors, William and Mary is led by President W. Taylor Reveley III., the Provost and six vice presidents who direct the academic and administrative activities and departments at the College.

The vice president for finance oversees the development and administration of the College budget and provides analysis and recommendations to the president. In addition, the finance office coordinates development of operating budget initiatives submitted to the Commonwealth of Virginia and the integration of all budget development activities into the overall planning activities of the College.

William and Mary's operating budgets in support of the College's various programs and activities for July 1, 2008 through June 30, 2009 were $273.0 million.

The College of William and Mary in Virginia is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (SACS) to award bachelor's, master's, post-master's certificate, doctoral and first professional degrees.

14.1.1.3 Departments and Schools

The College of William and Mary is a college in name only, reflecting the terminology used at the time of its founding. In fact, it is a small liberal arts research university with nationally ranked undergraduate, graduate, and professional

programs spread across five separate schools containing dozens of academic departments, interdisciplinary research institutes and state-of-the-art labs.

Arts and Sciences is the largest academic unit on campus, with 12 graduate programs and 35 undergraduate departments and interdisciplinary programs.

The four professional schools include: the School of Education, Law School, Virginia Institute of Marine Science (VIMS), and the Mason School of Business.

14.2 The Mason School of Business

14.2.1 History

The College of William and Mary was one of the first institutions of higher education in the United States with an orientation toward business education, beginning with the use of Adam Smith's Wealth of Nations as a text in political economy in 1798. The formal study of business was initiated in 1919, and a Department of Business Administration was established in 1941. Its first graduate degree program (Master of Business Administration) was established in 1967, and it became the School of Business Administration in 1970 with autonomy over degree requirements and curriculum. In 2006, it became The Mason School of Business, named for benefactor and supporter Raymond A. "Chip" Mason.

14.2.2 Management System

14.2.2.1 Mission and Strategy

In 1999, the Mason School of Business and its faculty adopted a strategic plan to accomplish the School's vision: Become established as a premier, but intimate, business school with a world-class reputation as a source of uniquely qualified future leaders in knowledge-driven business environments.

The following defines the School's educational mission: To nurture creativity, to mentor high-mindedness, to accelerate ambitions of leadership in our students that they might imagine the great business opportunities of the day and seize them. The five prime strategic *goals* currently driving all the planning and operations at the Mason School are:

- Lead business schools in personalized, experience-based education
- Be an agile, innovative enterprise achieving differentiation through programs
- Develop a faculty whose teaching, research, and service influence students, scholars, business leaders, and policy makers
- Engage students through innovative educational experiences that nurture creativity, mentor high ideals, and develop leadership capabilities

- Create graduates who are competitive in their respective job markets

The six key *strategies*—broad courses of actions in the face of uncertainty—have been reaffirmed as relevant for the current economic and highly competitive business education environment. They include:

- Improve MBA rankings to between 30 and 40, and undergraduate and MAcc rankings to top 20 by US News and World Report, Financial Times and Business Week; retain the top five ranking for teaching, published in the Princeton Review.
- Create a culture of innovation
- Engage in continuous curriculum and program improvement
- Lead in having corporations involved in instruction and working side-by-side with faculty
- Increase production of high quality research
- Increase visibility through purposeful marketing and communications

These goals and strategies are under continuing review by the faculty and administration of the School for adjustment to the prevailing economic and business environment. As part of this strategic plan, the need for a new building within the next decade was identified, as a critical success factor in realizing the School's vision.

Responsible for the management of the Mason School is Dean Lawrence B. Pulley. To him report the Associate Dean with responsibility for academic affairs, the Director of Development, the Chief Financial Officer, the Director of Administration and Operations, the Director of Marketing Communications, and the Executive Director for Enterprise Management.

The individual academic degree programs are headed up by Assistant Deans. The oversight responsibility rests with the Mason School of Business Foundation Board.

14.2.2.2 Programs

The Mason School of Business offers three degree programs and a number of business executive education (non-degree) courses. The degree programs and approximate enrollments are:

- Bachelor of Business Administration (BBA) Program (450 juniors and seniors)
- Master of Business Administration (MBA) Program (430 students)
- Master of Accounting (MAcc) Program (90 students)

An MBA degree can be received through the 2-year, 64-credit hour, resident MBA Program (200 students), the Flex (evening) Program (160 students), and the Executive MBA Program conducted over weekends plus in four residency weeks (70 students).

The School has been accredited by the Association to Advance Collegiate Schools of Business (AACSB) since the early 1970s; the Accounting Programs

also enjoy AACSB accreditation since a separate accreditation was instituted for Accounting. The various programs have been ranked among the best in the U.S or in some cases worldwide in publications, such as Business Week, the Financial Times, Wall Street Journal, U.S News and World Report, and in The Princeton Review. (The BBA program has been rated in the top 20, the MAcc in the top 30, and Resident MBA in the top 30's through top 50).

14.2.2.3 Curriculum and Learning Environment

The curriculum in each of the degree programs may be considered "traditional" in the sense that:

1. There is a substantial core curriculum covering the main functional areas of business and skill development, supplemented by elective offerings for students to develop focus and depth in a particular discipline.
2. Faculty utilize a variety of teaching methods—lecture/discussion, case method instruction, experiential learning (simulations, competitions, field trips/travel abroad over winter/spring/summer breaks, etc.).
3. Student group study and projects are utilized throughout the curriculum. Study groups are created when students enter the School, in each of the degree programs. These groups are maintained through the conclusion of the core program. Other groups form in electives and special projects.

14.2.2.4 Culture

What does distinguish the School's curricula is the careful management and monitoring of the learning process. The core curriculum is structured and sequenced to expose students to functional area topics and skill development activities across all areas of management. Special topics and speakers are woven into the daily routine. Core faculty groups meet regularly (weekly) to discuss day-by-day implementation of the program and student progress. Since the mid-1980s, each program has had its own faculty leader, termed "assistant dean," to organize the core group meetings, lead the review of curriculum initiatives and coordinate with other area/program activities. Significant curriculum changes, initiated primarily by these program faculty groups, have come about at fairly regular intervals (3–4 years) over the past two decades.

The faculty (approximately 55 tenure track plus a dozen clinical professors) prides itself on maintaining a balance of emphasis on teaching, research, and service. The School has worked hard to attract promising scholars, and research activity and productivity have increased markedly in recent years. At the same time, there continues to be a very strong tradition of excellence in teaching and student mentoring. Smaller class sizes, students' easy access to faculty and student collaboration with faculty on research projects, are hallmarks of the College, and

the Business School. In addition, beyond the normal School governance and committee activity, the Mason School and the College encourage faculty to engage in professional service in their academic discipline and in community service. Partly due to its small size and primarily to tradition, the faculty is not grouped in a departmental structure. Interdisciplinary research partnerships and team-teaching flourishes as a result.

14.2.2.5 Curriculum and Program Innovations

In recent years, a number of innovative curriculum initiatives/modifications have been embedded which have significant impact on "personalized, experience-based business education" Four such initiatives are:

1. Career Acceleration Modules or CAMs,
2. Field Consultancy program,
3. Leadership Advantage program or LeAd, and
4. Executive-level business expertise supplied by a group called Executive Partners.

14.2.2.6 Career Acceleration Modules

Co-designed by faculty and industry leaders, CAMs integrate advanced academic training in business with ongoing, direct contact with business experts. Each CAM provides an intensive, 7-week immersion course in academic and experiential activities including hands-on trips to corporate settings, consulting projects, case analyses, business simulation exercises, and an impressive lineup of speakers. Second year MBAs choose two from among a current list of: Entrepreneurship, Corporate Finance, Investments and Financial Services, Real Estate, Business to Customer ("B2C") Marketing, Business to Business ("B2B") Marketing, and Enterprise Engineering. MAcc students also have a separate CAM experience. This immersion in a real business environment allows students to cultivate a wealth of relevant, field-specific experience to discuss during job interviews, and apply immediately to a new career.

14.2.2.7 Field Consultancy Program

The School contracts with major companies across the mid-Atlantic region, deploying teams of 2-year MBA students to work as consultants charged with identifying, researching, and proposing a solution for a real business problem faced by their client organization. Mason School MBAs have confronted challenging assignments in areas, such as corporate and operational finance, marketing, strategy formation, management and organization, logistics and transportation,

human resources and information technology. Students with an entrepreneurial interest may choose to work on business start-up projects, under the auspices of the Entrepreneurship Center. Students seeking investment management careers may be part of the Batten Fund experience, managing part of the School's endowment with an equity fund, or researching stocks.

14.2.2.8 Leadership Advantage Program

Strong leadership and well-developed interpersonal skills have been identified as parts of the essential repertoire of successful executives within high-performing organizations. Six leadership competencies were determined through an iterative process of benchmarking and surveying that included input from hiring companies and business school faculty. A unique differentiator of the Mason Leadership Advantage program is that each student is paired with an Executive Partner who provides one-on-one coaching and is dedicated to the student's personal development and growth throughout the 2-year program.

14.2.2.9 Executive Partners

A key resource for each of these initiatives and for the School in general is an organization called "Executive Partners." Williamsburg is fortunate to have a wealth of senior business executives live in the area, and this volunteer group of over 120 active and retired business leaders, from over 20 different industries, share their experiences and guidance with students and faculty of the School. They work collaboratively with career services staff to discuss their own career experiences as a real-world perspective on various paths; they serve as expert advisors on consulting project teams; they are one-on-one mentors for students or personal coaches to help develop skills; and they collaborate with faculty to demonstrate how business theory applies to business reality in elective courses in the MBA curriculum.

14.2.2.10 Current Home of the School and Space Deficiencies

The Mason School had been located in Tyler Hall on the William and Mary campus since 1982 with about 24,000 "net programmable" square feet for classroom and office space. In 1990, the School acquired additional space in an adjacent building, Blow Memorial Hall. Graduate program classes and administrative support offices were relocated to this building in another 10,000 net programmable square feet. Despite modest growth in enrollments since then, the School needed additional office space and occasional classroom space. Some of that office space was scattered across campus and some staff office space was rented in a commercial office park. Neither Tyler nor Blow Hall provided very

much common space for student or faculty interaction. Speaker events, with more than 75 attendees, had to be located in a difficult-to-schedule campus facility or at some off-campus hotel or theater. Faculty offices were scattered throughout Tyler Hall over three floors. There were very few team meeting rooms for students or conference rooms for faculty/staff group meetings and very little "gathering space" for student interaction or for socializing. In sum, curriculum initiatives, such as those described above, were severely space constrained..

14.3 Alan B. Miller Hall

14.3.1 Concept Evolution and Design

A decision was made in the late 1990s by the Dean of the School of Business and the Business School Foundation to seek a newly constructed home with all programs and functions *under the same roof*. A conceptual study was undertaken, with input from the leadership of the College and with the help of Robert A. M. Stern Architects, primarily to determine the location of the new building and to establish an initial sizing and cost estimate.

A number of alternative locations were studied, both within and outside the current College campus boundaries. Eventually, the preferred location for the new building was selected at the northwest corner of Jamestown Road and Ukrop Way in Williamsburg, Virginia—at the very western edge of the College campus (see rendering at the front of the paper). For this location, a detailed architectural program, replete with room descriptions, was developed in 2001 with an H-shaped footprint, comprising roughly 174,000 sq ft (14,550 m^2) of gross floor space. This conceptual plan was then utilized over the next few years for fund raising and budgeting.

A critical feature of the building project was the structuring of the relationship between the Business School Foundation and the College (and indirectly, the Commonwealth of Virginia). A Memorandum of Understanding (MOU) was finalized in spring 2005 with the Business School Foundation as the developer of the project and a College Building Committee having oversight. Both the public-private financing package, with the College issuing bonds to partially finance an academic building, and also the building oversight structure, with roughly equal representation from the School and College, were different from anything the College had done previously. Many hours of discussion among the Dean of the School, Foundation Board members, and top College officials (the President and Provost in particular), took place over 2001–2005 to make this a reality.

14.3.1.1 Project Organization

When fundraising efforts proceeded to a point where firm, financial commitments could be made for the project, the Building Committee was formed.

14.3.1.2 Building Committee

TheBuilding Committee included College, School, and Foundation Board members and was co-chaired by the Dean of the Business School and the College Vice President for Administration. It functioned as the top decision-making management body during the design and construction phases. In addition to decision-making, the Building Committee was the coordinator of stakeholder relations management—both for internal and external stakeholders, from the various official local and state permitting agencies all the way to neighbors living adjacent to the new building. The Building Committee's key decisions and actions were at the outset:

- Hiring the project manager;
- Hiring the construction management firm and finally,
- Hiring the architect/engineering firm.

14.3.1.3 Mason School Building Task Force

In spring 2005, planning activities began for the detailed programming needs of the School, and a 19-person task force was formed consisting of Mason School of Business faculty, staff, students, and alumni. Their objective was to engage the many and varied constituents in the planning process, to assess space requirements and the character of the space, and to have input and oversight of the development of an architectural Program Statement. Once the architects were hired, the Task Force would serve as a sounding board and source of feedback for design concepts generated by the architects (e.g., building shapes, and program space adjacencies, and the like).

14.3.1.4 Project Core Team

As design drawings were developed and even well before construction began, a three-person "core team" (a subset of the Task Force) served to work with the project manager, the Dean of the School and the Building Committee, to ensure continuing and effective participation in the design and construction process by the user (the School of Business). This team served as a communication channel, integrating agent and often a decision-making group for design issues or construction changes over the 3 year design and build process. As an example, early in the process when cost estimates suggested that programmed space in the plan (1,86,000 gross sq ft) would not be feasible within budget and quality guidelines, the project core team was able to effect changes in the recommended plan expeditiously and with the backing of the Building Task Force.

14.3.1.5 Architectural Program Statement

Critical to the success of the project was communicating the needs and aspirations of the Mason School to the design architects and engineering firms. The Mason School Building Task Force described above was asked to determine the process for receiving information and input from all constituencies, to selectively visit existing business school buildings and corporate facilities for bench-marking; to report through the chair of the Building Committee; and to monitor progress through the design and construction process.

14.3.1.6 Activities in Developing the Program Statement

Constituent Interviews: Individuals from each component of the School, including administration, faculty, staff, and students, had the opportunity to articulate their constituents' program needs and planning issues and help to define the overall Program Statement.

Benchmarking Site Visits: In addition to a broad inventory of web-based research, members of the Task Force visited eighteen academic and four corporate educational facilities to observe current best practices, as well as to interview participants in the building projects to compile "lessons learned" that could be helpful to this project.

Focus Groups: While the interviews addressed specific needs of individual programs and departments, the focus groups provided interdepartmental commentary on specific building components. Six sessions were held, moderated by the consultant and members of the Task Force on topics, such as: classroom design, technology, common spaces, beyond the classroom learning, research, "look and feel", and student perspectives.

Surveys: While significant numbers of faculty and staff participated in the focus groups, some specific features or decisions benefitted from more complete participation of the users, and surveys were utilized.

Program Analysis Sessions: The Task Force and other guests participated in two interactive planning sessions to identify and validate the values and objectives of the School.

14.3.1.7 Design Attributes

The planning process focused on understanding expectations of various constituents such as:

1. Objectives the building must satisfy (e.g., functionality, cutting-edge technology, long-term adaptability, environmental harmony);
2. Ideal "look and feel" properties of the building (e.g., spacious, inviting, professional, vibrant, architecturally fresh but timeless quality); and

3. Fostering value-add activity and behavior (e.g., teaching, researching, learning, energizing, innovating, networking, mentoring).

Constituents wanted to protect and nourish the School's strong culture of collaboration and access, both between students and faculty, and among faculty across functional lines. And they wanted to expand that collaboration and access to business community and alumni in ways that were not feasible in our old space. When asked to describe a single characteristic that would affect the success of the building, *openness* was the most common response. Rather than simply spacious, the open building should feel inviting and welcoming and support opportunities for interaction. Well-designed common spaces should be as important as formal classrooms because so much learning and relationship building takes place in these spaces.

Tensions, however, exist in the desire for openness along stated needs for visual and acoustical privacy or separation of group activities. While preserving accessibility and collegiality, faculty need privacy for research and course planning/grading. While certain events may bring the entire School together, MBA students, classrooms, and team meetings desire separation from BBA students, classrooms, and team meetings. The goal was to strike a balance with different kinds of spaces to accommodate a range, from various group activities to individual, private personal spaces. Classrooms, too, are as varied as the ways in which people naturally learn and interact. Tiered-horseshoe, fixed-table classrooms are the mainstay, but flexible table layouts and seminar rooms complement, along with a "cluster tier" design layout to accommodate team interaction with classes (described later).

Flexibility and *adaptability* were also key attributes in the planning process. Mindful that the Mason School had undergone considerable programmatic, curriculum, and staff changes over the preceding 4-year period of 2001–2005, as well as technology advances, there was a strong desire to preserve flexibility as much as possible. Excess capacity in cable trays and computer floors in classrooms were sought, and considerable "shell space" was budgeted to allow at least some modest growth in classroom capacity, and suites for research institutes or curriculum initiatives.

The Task Force was certainly influenced by space constraints of the buildings housing the School over the past 15–20 years. Task Force members fought against being "anchored" to the past—ways in which the School was organized, trying to think of new, and better ways of operating. Competitive benchmarking with visits to various business and other professional schools certainly helped, as well as visits to corporate facilities. It became clear to the School's leadership that competitive business education in the twenty-first century required it to operate in a facility which innovatively integrates advanced course content and teaching methods with leading-edge technology, providing an environment conducive to the most productive interaction between students and faculty as a single academic community.

Finally, another essential design consideration of the building was that while its twenty-first century interior should include leading-edge technology, be

sustainable and efficient to operate, and flexible with regard to changing demands for its constituent spaces and functions, its eighteenth century Georgian exterior design should be time-less and compatible with its colonial William and Mary setting. College and School leaders early and often referred to its 100-year duration—to signify the quality of construction, maintainability, and flexibility for future changes or expansion.

14.3.1.8 Program Statement Results

The 80-page architectural Program Statement, produced in November 2005, was the prime input used as a starting point by the architects and engineers in their design and cost analysis. It presented a description of activities and space requirements associated with the educational, research, and service missions of the School, its faculty, staff, students, and other partners, comprising roughly 186,000 square feet (17,280 m^2) of gross floor space. Beyond the quantitative tabulations, it was also meant to describe the character of the building and its spaces, its look and feel, a facility befitting of the high aspirations of the School, the learning environment therein, and the creative activities of students, faculty, staff, partners, visiting executives, and scholars.

14.3.2 Delivered Facility and Technology

14.3.2.1 Project Management

The overall building project was executed as a construction manager-at-risk contract, and was managed by the highly integrated team of

- The architect/engineering firm of Robert A. Stern Architects of New York and Moseley Architects of Richmond, Virginia;
- The construction manager Whiting Turner; and
- The Mason School project manager.

14.3.2.2 Building Characteristics in Support of Higher Business Learning

Overall Architectural Perspective

The building style represents the historical language of the eighteenth century; it fits well into the Georgian style of the College campus. Being the second largest academic building on campus, it also serves as the appropriate western anchor of the entire campus—anchored at its eastern end by the historic Sir Christopher Wren Building built in 1695.

The internal organization of the building expresses the educational and social mission of the Mason School of Business—designed to respond to the challenges of modern business education. Spaces like the atrium, the public lounges and the abundance of other social spaces (breakout and team rooms, conference rooms, café, etc.), as well as their purposeful overlap with other administrative and faculty areas further promote faculty-student and student-student interaction and networking. Critical architectural decisions were:

- Single, unified front of the building to improve appearance;
- Development of the courtyard as unifying space;
- Balance between short-term and long-term objectives—e.g., upscale finishes as "wow" factor versus concrete block backup to exterior brick skin for durability;
- Hands-on approach by the affected constituencies in such areas as the program statement, classroom design, technology requirements, etc.;
- Balanced design for sustainability—immediate certification advantages versus long-term savings.

Key Building Design Features

The delivered version of Alan B. Miller Hall, with approximately 165,000 sq ft (15,325 m^2) of gross floor area, is designed to have a welcoming atmosphere and when opened in July 2009, appeared as a warm and inviting place providing as many opportunities as possible for students, faculty, staff, corporate recruiters, and other business partners to meet and interact. It incorporates the use of state-of-the-art audiovisual and computer technology to stimulate and enable innovative business thinking and creative approaches to learning and teamwork.

Common Areas for Interaction

The building design includes lots of circulation and common functional areas, such as lounges, wide corridors, informal, and diverse gathering areas for students, staff, and faculty. The front entrance way leads into a spacious three-story atrium and then to a suite of three lounges. Beyond the lounges is a large courtyard with natural grass and patios. Each classroom wing has wide corridors with separate student gathering areas for undergraduate and graduate students (see Table 14.1). Near the front entrance are located an executive dining room, a 100-seat café, and an outdoor café patio with additional seating.

Two open staircases off the atrium lead to a multi-purpose room on the second floor with seating for 400 theater style, or round tables with seating of 260 for a luncheon, dinner, or other seated program. The room can be subdivided for two separate functions and has stage and projection equipment in each section. Gathering spaces also exist on the second and third floors, mainly for faculty, staff, and visitors, but also for student meetings.

Table 14.1 Administrative suites and offices

Programmed space	Previous			New		
	Sq.ft.	No. of rooms	Percent	Sq.ft.	No. of rooms	Percent
Classrooms	10,721	8	29.8	17,690	12	18.8
Other academic space (labs, learning centers)	1,189	2	3.2	7,789	8	8.3
Student areas (team rooms, gathering areas, and lounges)	2,034	10	5.6	7,090	27	7.6
Business Library	1,964	2	5.4	2,307	3	2.5
Executive education	275	2	0.8	5,467	6	5.8
IT programming and support	773	4	2.1	2,927	9	3.1
School and program administration	8,453	61	23.5	11,909	78	12.7
Faculty space (offices, meeting and support rooms)	9,380	61	26.2	15,217	86	16.1
Common areas (entrance, atrium, common lounge)	1,228	4	3.4	4,013	4	4.3
Multi-purpose room	–	–	0.0	5,794	1	6.2
Café and executive dining	–	–	0.0	2,510	2	2.7
Other (storage and shell space)	–	–	0.0	11,113	11	11.9
Total programmed space	36,017	93	100.0	93,826	247	100.0

The table summarizes a fundamental shift in the allocation of space in Miller Hall. Not only is there considerably more space available to academic program areas, information technology support, conference rooms, and other meeting areas, but the percentage allocation shows an increasing emphasis on spaces for interaction outside the classrooms.

Team Meeting Rooms and Conferencing

Student team meeting rooms, 25 in number, are interspersed in the classroom wings of the building on the first floor and in a lower level facility. Separate team meeting rooms exist for executive education programs, and conference rooms are plentiful, some seating 8–10 and others seating 24, interspersed on the second and third floor. A special video conferencing board room for visiting executives or smaller groups is also located on the second floor.

Administrative Suites and Offices

Staff suites were designed with an open workspace environment wherever possible. This open architecture represents a change from the previous closed, cubicle-like staff offices, and should lead to greater collaboration. Access within suites to large, outside windows, and natural lighting is a planned feature of these spaces. Some staff will have closed offices as befits their mentoring, counseling positions,

or handling of confidential information. However, about 35 individuals, more than half of the staff of the School, are located in open work space suites.

Classroom Design and Teaching Wall

Appropriately, the design for the building initially focused on the classrooms. Multiple surveys were conducted and focus groups were convened on a variety of classroom-related issues. Many benchmarking visits of other schools, involving perhaps as many as one-third of the faculty, were taken. Certainly, considerable hours of informal conversations, and several physical mock ups were conducted over a 3-year period. Many issues were raised:

- Assurance that the portfolio of classrooms (number of rooms and capacities) aligned with enrollment forecasts for program offerings over the foreseeable future, and also aligned with the character of the School's programs.
- Location of classrooms. There was a desire for separation of undergraduate from graduate program classrooms (separate floors or building wings) and some separation of executive courses and executive MBA rooms. However, there is a need for flexibility to accommodate future demand shifts.
- Based on surveys, focus groups, and many benchmarking visits to other facilities, most faculty preferred a horseshoe-shaped, tiered room design where line-of-sight was excellent not only for the front of the room but for student-to-student case discussion type interchanges. This included considerable attention to detail such as one center aisle versus two for faculty to move around the room, height of the tiering, shape of the "teaching pit" in the center of the room, and an unobtrusive but convenient location of a podium.
- Designing classrooms and adjacencies to accommodate considerable and growing use of team study and team decision-making. While most faculty preferred a tiered horseshoe for most of their class sessions, they also desired the ability to have group dynamics take place during class sessions. The preferred solution was to design a layout that allowed five-six students to "group up" at their classroom seats for a simulation or other experiential learning exercise. Then they could "ungroup" (or regroup) at the discretion of the faculty member running the exercise. As a result, after considerable debate and drawings, the cluster tiered classroom design was adopted for four classrooms (Table 14.1).
- Given the sizable investment, cutting-edge technology in the classrooms with flexibility for future upgrades was expected. Surveys of faculty, focus groups, and benchmarking visits to recently constructed school buildings helped us to engage our architects and consultants and decide on our requirements. Wireless connectivity with hard wiring backup, raised computer floors in all classrooms, high-resolution projection on multiple screens, video conferencing, audio requirements and lecture capture systems, document cameras, etc. were recommended.
- Classroom podiums were another focus—should they be fixed or mobile? What critical components must they contain to keep them unobtrusive in size and what

components could be positioned in a more remote closet or wall cabinet? Much discussion and physical mock ups helped us come to closure on this issue, balancing technical features with ease of use for faculty.

- The front teaching wall was a topic that benefited from many hours of debate and two physical mock ups. At the heart of the debate was divergence of opinion over writing space (blackboard or whiteboard) versus video projection. Like any faculty, there is a wide range of teaching styles and preferences (and no shortage of egos). Some faculty utilize whiteboards extensively in case discussions or lectures and consider it an art form of how to organize information to maximize student learning. Other faculty use video projection almost exclusively and see little need for whiteboards going forward. Almost all faculty desired multiple projection capability so that spreadsheets and power point (or document camera) displays could be shown simultaneously. Most wanted some whiteboard space visible for the students along with video projections. Most faculty also wanted consistency for all rooms for the teaching wall, while some thought some room specialization was desirable.
- The teaching wall adopted is shown in the illustration below (Table 14.1). Except for two smaller seminar rooms, the standard classroom ceiling height (14 ft) and front wall width (22 ft) allowed projection of two wide aspect images (11 ft wide by 6 ft tall) on a permanently mounted screen, side-by-side above white board panels. Additional wide board panels roll up and down behind the projection screen. Because the projection images are about 6.5 ft above the floor, faculty can freely roam the front teaching pit area without obstructing student views. Two mock ups were conducted to test line-of-sight.

In summary: Leading-edge classroom design to accommodate today's highly interactive teaching and learning environment was the key foundation block to the overall building layout and technology content. Key features of every classroom include:

- Individually addressable, remotely controlled multiple (up to three) projectors;
- Teaching wall containing dual screens and simultaneously visible whiteboards;
- Single podium containing session computers and controls;
- Audio/video lecture capture.

Research Environment

While its magnificent visual appeal of Alan B. Miller Hall is undeniable, the building's design is more than skin deep—it offers several functional benefits for research: collaboration, communication, collection, and inspiration.

First, the new building should foster greater interdisciplinary collaboration and co-authorship. In the previous facilities, faculty offices were not physically situated in such a way as to encourage interaction. In the new building, this is to change, and without departmental limitations, natural cross-pollination should grow. For long distance collaboration, much better technology exists for video

conferencing, for one-on-one meetings and small group collaboration/teleconferencing. For sponsored research programs, Miller Hall offers opportunities with executive center classrooms, meeting rooms, and considerable shell space.

Second, the new building offers faculty and staff more opportunity to meet, socialize, and communicate across areas and programs. The building offers its own café and faculty dining area, as well as numerous conference rooms, and many informal meeting spaces. Such spaces make it more likely to share research and engender a greater appreciation for the work that is being conducted in the School. More faculty awareness produces appreciation for individual research progress and fuels greater innovation in the faculty's collective efforts.

Third, Alan B. Miller Hall offers a state-of-the-art behavioral lab, survey data collection facilities, financial laboratory, communications lab, e.g., dedicated facilities that were not available to researchers in the previous space. Not only does this enhance the capacity for faculty to conduct meaningful research but also engages potential faculty and peers at other schools to view us as a significant research institution.

Finally, the splendor of the architecture offers inspiration. One cannot step into that space without feeling the desire to be better, to feel worthy of such a magnificent structure. Alumni and other donors seemingly share that excitement.

Special Facilities for Competitive Business Education:

Financial Markets Center

Students pursuing careers in finance, particularly in the areas of trading and investments, must be prepared to work in an environment where success relies on the ability to quickly make sound decisions informed by synthesizing vast amounts of information from a variety of sources. Replicating this type of environment for students cannot be accomplished in a traditional classroom. It requires a space that has the technology and "feel" of a real-world trading room.

While many business schools house a "trading room," the Mason School's Financial Markets Center (FMC) is unique in design, in that it paid special attention to how students and instructors interact. While each student work station includes a computer and dual flat screen monitors, everyone also has unobstructed sight lines to the instructor and ample work space for note taking and personal laptops. In addition, the FMC incorporates multiple projection options for lecture slides and video presentations as well as superior lighting and acoustics. The main room's tiered seating design is flexible enough to handle a standard class size or special smaller work teams. In particular, the more intimate front tier caters to the needs of a small work group. Thus, this room provides perfect work space for the students running the Mason School's Batten investment fund.

Students and faculty are able to access the resources offered in the room in both "classroom" and "financial laboratory" modes. The FMC features real-time financial data and professional research tools to provide students with hands-on

technology training. These include several Bloomberg terminals as well as other specialized financial trading software and databases available at each student's workstation. Market price and news display boards and video walls running around the room create a realistic and lively atmosphere for learning. Visitors and students walking past the FMC get a taste of the action just by looking through the FMC's large glass corridor wall. Finally, the FMC is designed to accommodate changes in technology so that the facility remains state-of-the-art.

Behavioral Laboratory

The Behavioral Laboratory planned for the new business school building is designed to support the behavioral research of faculty members in multiple disciplines: marketing, organizational behavior, operations, accounting, and finance. It enables basic and applied research on a diversity of behavioral questions related to investments, marketing, management, and interpersonal issues.

The new facility allows our business school researchers to study the basic cognitive and affective processes underlying effects (processes that people may not be able to recall or represent accurately).

With two group observation rooms and a large survey administration (data collection) room, the laboratory allows researchers to monitor response times, facial expressions, interaction patterns, and even eventually measure eye gaze (e.g., to determine what parts of a marketing message or a web interface capture the participants' attention). The observation rooms allow for participants to interact without constant reminders that they are being observed. Flexible partitions in the large data collection room ensures that participants' responses can be private and not influenced by what decisions are being made by others in the room.

In addition to supporting faculty research, the new facility also lends itself to focus group observation and recording, providing a space for marketing students and MBA students working on field consultancy projects to test new ideas with select samples of consumers or employees. The research space also allows undergraduate students to get hands-on experience in research and data collection, helping them to become better consumers of empirical research [see also (Kornwolf 1989)].

Communications Center (Laboratory)

The Communications Center in Miller Hall is a new venture for the Mason School. Having dedicated space for students to enhance their speaking, writing, listening, and other communication skills acknowledges the importance of these abilities in the professional business world.

As a laboratory, the Center includes integrated space for completing class assignments, student practice, meetings of writing groups, peer reviews of students, and video and sound recording of students for professor feedback. The Center comprises three rooms: a large conference room, a smaller conference

room, and an observation/control room that allows confidential observations of students practicing their presenting, interviewing, or other skills related to communication. In addition, a smaller entrance room provides for a small library or student work area.

Each room in the Center contains state-of-the-art technology. Each conference room is outfitted with 32" flat panel video displays with integral stereo loudspeakers. These monitors serve many purposes. Among these is direct observation of students in the other conference room to simulate video conferencing. These monitors are supplemented by two video cameras with control extenders in each conference room to enable images to be captured and controlled of everyone in each room. Split-screen technology allow students to see the people in the other room and also see the video image of people in their own room. In addition, sessions can be recorded and played back for classes or for individual instruction. These technologies may also be used to communicate with people in other sites distant from the Mason School.

The Center allows students to have simulated real-life experiences. It also enables the school to expand and supplement curricular offerings in ways not possible presently. For example, distant learning or meeting management opportunities may be considered.

Business Library

The spaces in the Alan B. Miller Hall designated for the Business Library are utilized as follows:

- Circulation room/casual seating area is the entry way into the Business Library. It contains the information/reference desk and several groupings of chairs and tables for quiet study/reading. The lower walls are lined with shelving for the print and media reference collection.
- The research area (reading room) contains the work stations (carrels) for student research and studying. This area also includes the power sources and data connections (as well as wireless connectivity) for computer use. There are a number of Library-provided computers at several work stations for patron use. The public access printer/copiers are also stationed in this room.
- A computer laboratory structured both for software-intensive classes/coursework and for group study and discussion. It can be used for training/orientation and database demonstrations by the Business Library and is accessible for group study after hours.

Entrepreneurship Center

One of the fast growing and highly sought after areas of business education in the Mason School is on the subject of entrepreneurship. Not only do students receive

lectures and presentations on the founding and managing entrepreneurial enterprises, but they also have a chance to actually invest in their own new businesses, and run them from the School.

Unfinished shell space has been set aside for the Entrepreneurship Center. It is designed to facilitate a number of typical entrepreneurial activities, from investment planning, through market research and firm modeling all the way to board meetings of already operating companies. The physical design of the Center allows quick transformation of its 3,000-plus square foot space into a team planning room, a large conference room for meetings and small conferences, or a boardroom to simulate enterprise executive decision-making sessions.

14.3.2.3 Information Technology

Building Technology Infrastructure

The technology infrastructure is powerful and present throughout the building. The building is integrated into the campus communications network. A system for providing unlimited and flexible telecommunications and computer network access at all instructional, research, service, and office locations is installed. In addition to hard-wired cable connections for data to all workspaces, a wireless signal environment is maintained throughout the building. Technology design to accommodate future change was based on providing for growth in both power and bandwidth requirements, including these features:

- Distribution grid on all levels and all areas
- Easy access to pathways/cable trays both vertically and horizontally, including such design features as cable trays to facilitate horizontal and stacked conduits for vertical expansion. The pathways permit cable to be pulled to any point in the building, thereby facilitating future installation of new equipment or relocation of existing equipment.

Internal communications and public signage within the building is implemented through a network of liquid crystal displays (LCD's) distributed on all three floors. There is also a Wayfinder touch panel installed at the main entrance to help visitors find people, events, or spaces within the building.

Classroom/Meeting Room/Conference Room Technology

Technologically, classrooms have smart audio-visual (AV) and computing interfaces that facilitate both lectures and class discussions. Every classroom is equipped with the same basic technology setup and the same universal control interface. These technologies allow faculty to move seamlessly from didactic (e.g., PowerPoint) presentations to group discussion and capture of key points (e.g.,

whiteboards, digital camera projectors). All on the fly; it is possible to display both simultaneously.

The fixed classroom tables support laptop power and network connectivity at each seat. In flexible classrooms laptop power outlets are in the floor and network connectivity is primarily wireless.

Classroom technology includes "lecture capture", the ability to digitally record lectures, presentations for instantaneous (synchronized) re-broadcasting or asynchronous distribution by other means. Confidence monitors enable teaching faculty to follow the projected material from their podium, without turning around to view the teaching wall.

Classrooms, meeting rooms, and conference rooms are equipped with exterior scheduling display panels that indicate the reservation status of the room, along with basic information on the event taking place there. These digital panels are also connected to the central scheduling system and event calendar for overall monitoring and control.

There is a video teleconferencing (VTC) conference room on the second floor, near the Dean's suite to provide full VTC capability to faculty, staffs, and even invited outside visitors.

Information Technology Support

The Information Technology support area is staffed by eight professionals and a manager. This centralized office area includes:

- Manager's office
- Workstations for up to eight professionals
- Conference area
- Repair workshop, with storage
- Help desk area at the entrance that supports walk-in service
- Counter space with power/network connections to work on laptops and other equipment brought in for service

This arrangement makes communication and interaction among the IT staff natural and easy. At the same time, direct communication between IT and classrooms is provided for to ensure fast response to service calls during teaching events.

14.3.2.4 Sustainability

The two factors which made the design and construction of a sustainable building possible were:

1. The decision to pursue a Leadership in Energy and Environmental Design (LEED) certification, and

2. The availability of a number of LEED-accredited professionals on both the design and construction teams. Overall, the new building received a LEED "gold" rating.

Constructing the new facility at a high level of sensitivity to "green" practices brought cost dividends from the beginning of construction, such as recycling construction waste throughout the entire construction period, and maximizing the amount of construction materials produced or fabricated in the region. Additional efficiency and productivity gains will be realized during decades of future operations, through many of the following features:

- An underground cistern installed in the courtyard to collect rainwater for ground irrigation purposes;
- Occupancy sensors in classrooms and most office areas to turn lights off when the room is unoccupied;
- Choice of "green" certified furniture and carpeting for the entire building;
- A storm water management plan that minimizes the impervious area that produces storm water runoff and includes bio-retention areas;
- Energy efficient solutions throughout the building (energy-conserving lighting and appliances, high-performance wall insulations, energy efficient heating and cooling).

14.4 Conclusion: Factors leading to Project Success

Alan B. Miller Hall was ready for occupancy in July 2009, and classes started late August 2009. The building has met all expectations. The project has been delivered on-time and under budget, and much more importantly, there is a buzz of excitement about the building from each of the constituents.

We are reminded by our project manager of some factors that proved very useful in the successful planning and implementation:

- Widespread initial involvement of the future users (faculty, staff, students, donors, and Foundation Board members): This was accomplished early in the process with interviews, focus groups, and planning sessions, but it continued throughout the project. While everyone's views cannot be implemented, there is a widespread feeling among faculty and staff that they had their chance to influence the result.
- Benchmarking visits: Many relatively new business school facilities have been constructed in North America in the last several years. Some visits were chosen for their overall appearance and design, while others were chosen for special elements or features. Internet websites are useful for gaining perspective, but nothing substitutes for seeing and touching a facility in person.

- Considerable and constant flow of communication with all the stakeholders about the progress: This began with newsletters to faculty, staff, and students while the Task Force was involved with the Program Statement, but it continued with regular updates at faculty, staff, alumni and donor, Foundation Board meetings; and with numerous blogs on web sites. It involved outreach to the broader College community and to the residents of the town of Williamsburg near the building site.
- Numerous and thorough tours of the building during construction led by the project manager: Perhaps as many as a thousand alumni, donors, faculty, staff, and students—including prospective faculty and students—have had hour-long tours of the building. The project manager suggested and avidly supported this activity, and the tours were expected to be well received. In fact, the enthusiasm and excitement generated from the tours has exceeded all expectations. Again, nothing substitutes for seeing a facility in person and touching it.
- Continual involvement of the benefactors: Many trips were taken by the Dean, accompanied by the design architects, to the offices, and homes of key donors and Foundation Board members from the beginning of the project through completion to explain design and site parameters and to seek input on certain decisions. The importance of keeping these key supporters engaged in the process and enthusiastic about the results was critical.
- Continual involvement of the users: Program needs identified in 2001 and again in 2005, were not necessarily the needs existing at our occupancy date of July 2009, since curriculum initiatives are dynamic and programs, enrollments and staffs did change. The three-person Project Core Team served as a filter for communication and construction/design issues with faculty, staff, and Foundation Board members and eventually, all key decisions came back through this core group.
- Continuity of the project leadership teams: Although there has been change in College leadership and several senior staff/faculty within the School, the Dean of the School, the Project Core Team, key Foundation Board, and Building Committee members remained the same key players. The Dean in particular has been a driving force, relationship-builder, and head cheerleader to keep the project on track over an approximately 10-year long period.
- Mock ups: As noted about the value of seeing/touching, mock ups were used for fine-tuning classroom layouts, front teaching walls, podium design, and many architectural/construction details.
- Flexibility/capacity for the future: To the extent possible within budgetary constraints, the building included excess capacity for inevitable technology upgrades as well as "shell space" for future centers, office needs, or a classroom. To the extent possible, classroom footprints were designed to make seating layouts adaptable for future change; classroom floors raised for technology alterations; and excess capacity included in cable trays and IDF closets.

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