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SPACE PLANNING

as a Catalyst for Developing a Culture of Change

IN 2011 Northern Michigan University (NMU) embarked on a building renovation project that, through collaboration among the administration, academia, and support departments, saved over \$2.4 million in construction costs, provided annual operational cost avoidance of over \$40,000, and fostered a paradigm shift in course scheduling for the entire campus, changing how instruction is delivered on our campus. This article outlines the evolution of space planning at NMU and how it exponentially improved building efficiency because of the team charged with delivering a new building.



EARLY SPACE PLANNING

Through the years, NMU has been working to improve space management, which for a long time simply meant tracking space using an electronic database. This eventually evolved into a desire to analyze classroom and laboratory use. This idea, coupled with a requirement by the State of Michigan to report on space utilization as part of the capital outlay request process, led NMU to assemble a team representing the facilities department, registrar's office, provost's office, and instructional technology office. Their task was to evaluate, select, and implement a single software solution to handle course scheduling by the registrar's office as well as manage space assignments by the facilities department.

Initial reports on classroom utilization revealed a number of trends that up until then were thought to be true, but lacked the data to substantiate them, such as: 1) The highest utilization rates were between the hours of 10 a.m. and 3 p.m.; 2) early morning, evening, and Friday utilization rates were low; 3) classrooms controlled by individual departments, not available for scheduling by the registrar's office, were utilized far less efficiently; and 4) there were inconsistent scheduling patterns. The first-year reports showed that average classroom utilization between 8 a.m. and 5 p.m. Monday through Friday was just under 45%, with an average seat utilization of around 65%. These rates not only demonstrated that NMU had ample classroom capacity to meet both current and future demand, but also suggested that NMU may have had an excess number of classrooms. Under the direction of the university president, the Space Utilization Committee was formed to help analyze space use and make recommendations on ways to improve efficiency. The committee reported to the vice president for finance and administration, and included a broad representation of academic and administrative departments. The formation of this working committee helped foster awareness of classroom utilization and the importance of wise space management.

Early recommendations from the committee focused on who controlled classroom space and when/where classes were scheduled during off-peak hours. In cooperation with the Space Utilization Committee, deans and department heads turned over department-controlled classrooms in poor condition or with



low utilization to the registrar's office. In exchange for the department relinquishing control of the space, the rooms were refreshed and the department was given first priority for scheduling that space.

Other recommendations from the committee considered where evening and weekend classes were placed. Course placement guidelines were developed, referred to as "priority" and "consolidating" scheduling, to concentrate weekend and evening classes in select buildings, allowing facilities staff to turn down HVAC and lighting systems in buildings with no classes.

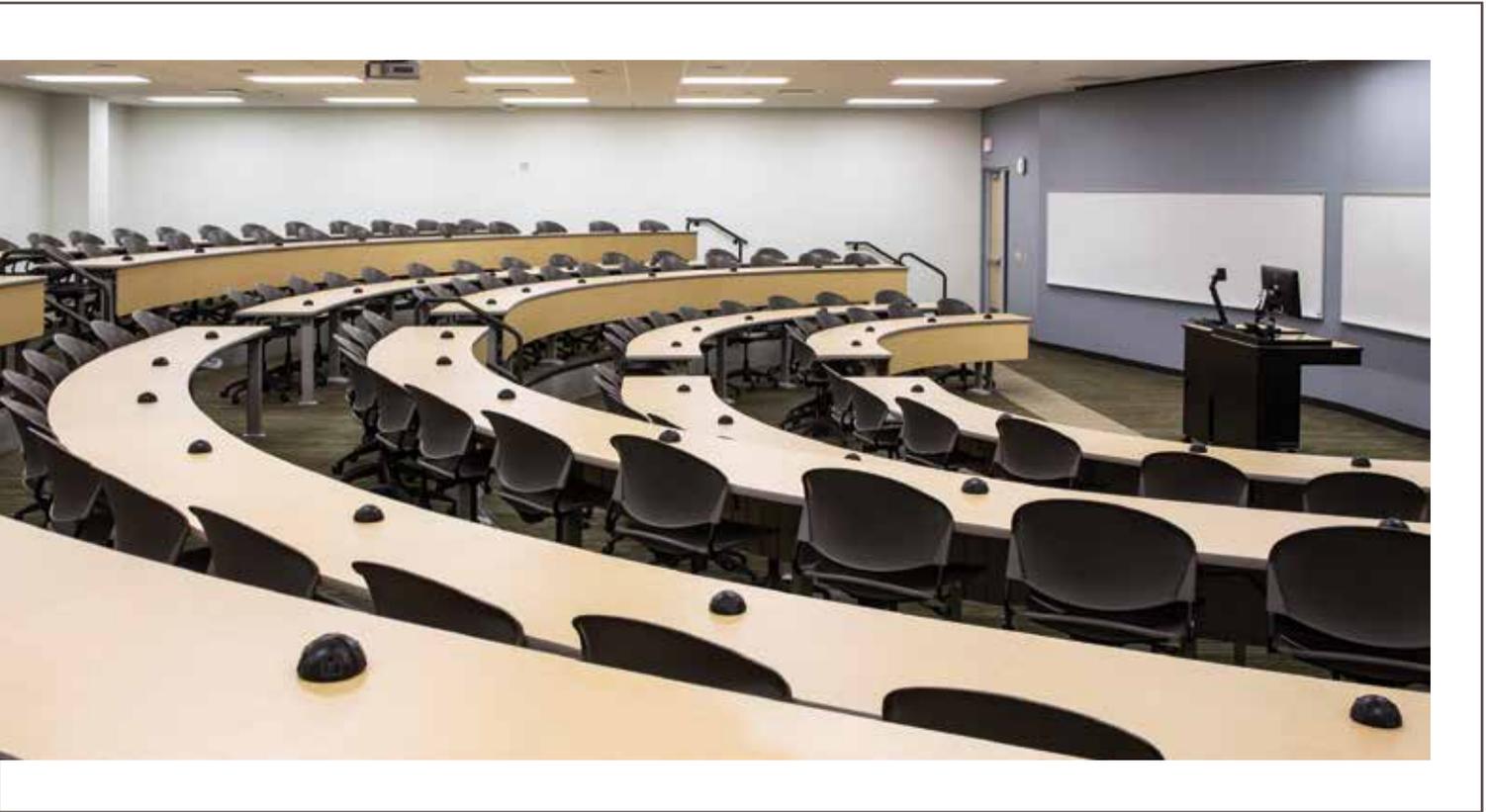
In addition, the registrar's office was provided color-coded floor plans identifying the mechanical zones within each classroom building. These plans would be used to systematically place courses in as few zones as possible within a given building, providing further reduction opportunities by only running the HVAC systems serving occupied zones. These two practices were well accepted by faculty, had little to no impact on course scheduling, and provided real, documented savings.

THE PARADIGM SHIFT

The real change began in 2009 when NMU was awarded approval to proceed with the renovation of its primary classroom building, John X. Jamrich Hall. Completed in 1969, this two-

until 2009 all of the reporting, benchmarking, and recommendations on utilization had been conducted internally and only used to modify course placement.

Building on the campus' ongoing discussion regarding space utilization and the potential this opportunity presented, the university considered it essential that part of the design process include outside experts to evaluate its classroom stock and help determine the right quantity, size, and type of classrooms to be delivered as part of this project. Their first task was to conduct a space study of NMU's entire classroom stock. This project, although focused on a single building, was to look globally at classroom utilization and evaluate the utilization, type, and condition of all NMU classrooms.



story facility was designed primarily for lecture-style instruction. It had large, underutilized tiered lecture halls, lacked many of the amenities of new modern classrooms, and was difficult to adapt to new collaborative/active teaching and learning methods. Despite its shortcomings, the building contained 50% of the university's general use classrooms.

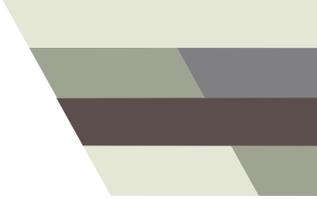
Project planning began with the goal of providing an efficient, state-of-the-art facility that improved academic delivery, maximized building use, and reduced overall operational and maintenance costs—the same space utilization goals the university had been working toward with its existing facilities. However, up

The results confirmed prior reports indicating below-average utilization. Average classroom usage for the 2010 fall semester equated to 22 weekly room hours (WRHs), well below the space planning consultant's recommended utilization standards of 28.5 to 31.5 WRHs. The review also indicated that approximately 77% of course offerings had an enrollment of 40 students or less; while 72% of the classrooms had capacities greater than this, reaffirming that many large classrooms and lecture halls were underutilized. These results were shared with the university administration, academic deans, department heads, and faculty. They were presented with the op-



portunity to either rebuild capacity as it currently existed, or through this project, rightsize NMU's capacity to match demand. It was determined to set NMU's standard utilization to a minimum of 28.5 WRH, with the understanding that rightsizing our capacity would result in fewer and smaller classrooms. This in turn would require the development of standard scheduling guidelines that all academic departments would be required to follow.

Collaboratively, the provost's office, registrar's office, and facilities department developed a clear set of policies to standardize scheduled patterns and more equally distribute courses between 8 a.m. and 5 p.m. The rules below were developed, tested, and (with input from department heads) refined prior to implementation.



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SCHEDULING RULES:

- Courses should be offered with MW, TR, MTWR, MTRE, MWRF scheduling patterns.
- Single-day courses should be offered on Fridays or during evenings
- Start courses on the hour (8 a.m., 9 a.m., etc.). 6:30 p.m. is acceptable.
- Fifty-minute courses should be offered from 8 a.m.-5 p.m.
- Evening courses should be offered from 5 p.m. or later. 5:00-5:50 p.m. is OK; the rest should be "blocked."
- Stay away from 5:00-6:40 p.m. for evening courses.
- Block Scheduling (example: 2-day, 4-credit courses should be offered from 8 a.m.-8 p.m.)
- Classes have to be distributed throughout the day, with no more than 10% scheduled at any one hour.

Once design was set for the new building and the rules were developed, there were a number of outreach meetings with the academic departments to reinforce the fact that once the facility was complete, NMU would have fewer general use classrooms than it had before, and so the above rules would be crucial for successful course placement. During the three semesters that the new building was under construction, departments were required to implement the new scheduling rules and were graded each semester on how well they conformed to them. Reports were generated by the facilities department that outlined an academic department's conformance to each rule, then provided to the academic deans, who in turn worked with department heads to review compliance and modify schedules to better conform to the new rules.

Concurrent with the planning associated with classroom utilization, NMU worked to understand what type of classrooms and classroom technology was required to meet current pedagogical needs. To understand this need, faculty were provided the opportunity to take part in a number of on-campus workshops designed to demonstrate active or collaborative teaching techniques. Following these demonstrations, faculty were surveyed and asked what the preferred classroom type was for each class they taught: lecture, seminar, or collaborative learning. This survey data was then compiled with the space utilization data to shape the quantity and type of the classrooms required to meet the academic need. The demonstrated need not only resulted in fewer classrooms, it shifted a large portion of the classroom stock from large, lecture-style

auditoriums space to smaller, 30-to-40 seat classrooms that supported active/collaborative learning. One of the unanticipated results of this study was that the new classrooms' demonstrated need could not be efficiently adapted to the existing structure, and because of the difficulties associated with filling the large, underutilized lecture halls, it would be more efficient to build a replacement facility.

THE RESULT

In 2014, NMU completed its \$33.4 million, 133,000-square-foot, mixed-use academic facility, which has become the most sought-after location on campus for students and faculty alike. It contains 24 high-tech classrooms (8 fewer than the building it replaced); room capacities were designed to match course enrollment; technology and equipment were provided to match instruction styles; and all spaces are highly adaptable to changing technologies and teaching methods. Because of the planning associated with this project and the campus initiative to set a target utilization rate, overall classroom utilization has increased to an average of 63-75% within the new facility between 8 a.m. and 5 p.m. On-campus classrooms have been rightsized to match both quantity and capacity, reducing building square footage, resulting in estimated construction savings of just over \$2.4 million, and providing cost avoidance in annual operational costs of just over \$40,000.

The success of this project can be directly attributed to the collaboration and team approach among so many different stakeholders. Not only did the effort deliver a truly exceptional classroom facility, it fostered a paradigm shift in the way NMU delivers instruction and manages its resources. 

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