Office of Continuous Improvement

Annual Report

Fiscal Year 2018

This report is a summary of the continuous improvement activities
on the campus of Michigan Technological University for the 2018 fiscal year.

Pictured here: Employees learning how to improve the flow in a process by eliminating wastes like waiting, excess inventory, rework, and motion

Mission Statement – Office of Continuous Improvement (OCI)

The mission of Michigan Technological University's OCI is to provide exceptional value to the university by spreading a continuous improvement culture using Lean principles administratively, experientially, and academically through faculty, staff, students, and the Lean community.

> "Our goal here at Michigan Tech is to help our students succeed. Lean is a way of thinking that can allow us to better achieve that goal. Lean is about continuously looking for ways to improve the way we do things, so that we can more efficiently and effectively help our customers, the students, succeed."
>
> -- Andrew Miles, Financial Aid Manager

OCI Activities for Fiscal Year 2018

OCI conducts activities in three areas. First, it advises, encourages, and supports Michigan Tech students and the Leaders in Continuous Improvement (LCI) student organization on their Lean journey. Second, OCI provides consultation and education on Lean thinking and practice to the academic units as they create a Lean culture and curriculum and to administrative units as they improve the efficiency and effectiveness of their processes. Third, it forms a central hub for training, coaching, and improvement activities to enrich and optimize the university workforce and the community. Safety is integrated into each of these three areas as a fundamental Lean objective. The work of OCI directly supports the major goals in Michigan Tech's Strategic Plan by contributing to multiple subgoals. For an extended description of OCI activities, please see the Board of Trustees Updates on the Michigan Tech website.

1. *Advise, encourage, and support Michigan Tech students and LCI.*
   - Provided advisor, support, and resources for LCI
     - Joined LCI industry tours to Empire Level, Galland Henning Nopak, and Charter Steel, arranged by Michigan Tech alum Heath Nunnemacher
   - Supported projects for student teams in quality-related courses that teach statistical methods, in the Pavlis Honors College. This is a critical function due to the limited manufacturing industry in the region
     - Project to investigate the increase of PC utilization in the Library
     - Project to improve senior-level registration processes for Enterprise
     - Project to improve the IT password reset process
     - Project to reduce late pick-ups in catering

    - Project to improve customer flow at the North Shore Grill and Deli
    - Project to improve the campus bookstore's web order process for student course materials
- Supervised student process improvement coordinators as they developed and delivered student-to-student information sessions on Lean tools for gathering and sorting ideas, opinions, or issues, and workplace organization
- Provided Lean overviews to students in several classes in the School of Business
- Taught ENT3982 Continuous Improvement using Lean Principles academic course in the fall and ENT3983 Culture of Continuous Improvement in the spring
- Began every training and academic session explicitly connecting Lean and safety
- Connected guest speakers and visitors from Lean organizations with student groups
- Included students in campus Rapid Improvement Events
- Guided, supported, and trained student process improvement coordinators to work collaboratively with campus Lean facilitators

"[Lean is] a continuous cycle of learning, improving, and growing! I had no idea what Lean was a year ago, but in this year it has turned every aspect of my life around for the better. I'm taking 18 credits and working about 30 hours a week, and it's possible because of Lean. My home life is organized because I set standards, my work ethic has improved greatly, my mind has opened so much to the world, and most importantly, my relationships with everyone (co-workers, bosses, parents, siblings, friends, boyfriend, etc...) have improved exponentially. Lean has genuinely changed me for the better."

-- OCI Student employee, explaining Lean to another student

2. *Provide consultation and education on Lean thinking and practices to academic and administrative units.*
    - Facilitated Rapid Improvement Events in support of:
        - The Provost's allocation of faculty time* and streamlining of lab fee requests*
        - The Van Pelt and Opie Library's conference room scheduling*
        - Human Resources' job description binder, promotion and tenure reappointment process, obtaining social security numbers from nonresident aliens, special handling green cards, and Techfit
        - Student Affairs and Advancement's commencement volunteers*, commencement ticketing*, visual management of student employee projects, and visual management of the new student organization application process
        - Memorial Union Building's basement storage and overall organization*

- Information Technology's service desk item drop off* and standardized knowledge base and service catalog
- Facilities Management's central supply office* and security inspections*
- Auxiliary Services' loading dock storage room* and event management pilot with First Friday
- Material Science and Engineering's Foundry Lab* and purchasing card process*
- Sponsored Program's file systems*
- Sponsored Operation's electronic signatures for cost share authorization forms
- Mont Ripley's Ripley Kids Ski School*
- Central Ticketing Operation's locker room assignment process*
- Portage Lake Golf Course's storage area*
- The Associate Vice President for Administration's visual management for action items
- The Graduate School's group huddle

*For more information on these improvements, see Table 1, Curated List of Rapid Improvement Events, below

- Provided grant proposal support for a National Science Foundation Advance Grant to increase the participation and advancement of women in academic science and engineering careers
- Encouraged employees in the development and delivery of Lean presentations: Van Pelt and Opie Library employees presented at the Michigan Academic Library Association and the Michigan Lean Consortium, and Ticketing Operations employees presented at INTIX International Ticketing Conference

> "My kids really enjoyed the lessons this year—there was a switch up—something was really different with the program. This year was noticeably better organized."
>
> -- Parent feedback after a Ripley Kids Ski School rapid improvement event

3. *Develop and engage our workforce and community.*
   - Hosted distinguished guests Dr. Bill Balzer, author of *Lean Higher Education* and a professor at Bowling Green State University; Karyn Ross, author of *The Toyota Way to Service Excellence*; and Jeff Hebbard, Vice President and Chief Operating Officer at TIDI Products LLC and Michigan Tech alum, all of whom provided presentations and workshops for the campus and community
   - Hosted visitors Teresa Schissler-Boichot, Service Delivery Leader at Challenge Manufacturing Company and Michigan Tech Alum; Heather Arnold, Manager of Manufacturing & Technical Support at Amway; and Jim Zupancic, VP for Operational Excellence, and Bryan Wadie, Senior Operations Leader, from Standex

- As a paid consultant, delivered Lean Facilitator training to a cohort from St Norbert College in De Pere, Wisconsin, in support of their strategic initiative of a Lean transformation
- Selected as Examiner for the Baldrige National Quality Award and for the Michigan Performance Excellence program
- Selected as Reviewer for American Society for Quality (ASQ) World Conference proposals
- Presented at Michigan Tech's Presidential Council of Alumnae annual meeting, the Michigan Lean Consortium annual conference, and the Network for Change and Continuous Innovation annual conference
- Hosted a Lean Coffee Chat with the Michigan Lean Consortium Board of Directors
- Delivered Lean-related workshops for Michigan Tech's Financial Services and Operations and Auxiliary Services' Professional Development Day
- Trained new cohort of 17 campus Lean Facilitators
- Launched a comprehensive Lean facilitator training and development certification program
- Delivered the Lean overview at all Michigan Tech's New Huskies Employee Orientations
- Managed Copper Country Lean Group meetings
- Created and delivered five new workshops for Michigan Tech employees: Evidence Based Problem-Solving Methods; Collecting and Visualizing Metrics to Support Improvement; Finding the Source of the Problem: Root Cause Analysis and Decision-Making Tools; Countermeasures: Solving Common Problems using Lean Methods and Tools; and Combining Lean and Safety: A Powerful 1-2 Punch
- Delivered employee workshops on 5S Workplace Organization and Process Mapping
- Contributed to Lean community via social media, including Instagram, Twitter, and a blog with frequent guest bloggers
- Facilitated campus Rapid Improvement Events, as shown in Table 1, Curated List of Rapid Improvement Events, below
- Supported monthly report outs for Auxiliary Services
- Integrated safety as a topic into daily huddles
- Provided continuing education and training to campus Lean Facilitators

Office of Continuous Improvement
Table 1. Curated List of Rapid Improvement Events

Event Name	Sponsoring Department	Event Description	Results	University Strategic Goals
5S Central Office Supply	Facilities Management	Facilities management shared a common drawer space for supplies. The drawers were incorrectly labeled, making it hard to identify where to find something or where to put something back. There were excess supplies and supplies that couldn't even be used anymore such as floppy discs.	A 5S workplace organization method was applied. The drawers were sorted, shined, and set in order. A plan was created to create standards and sustain the plan in the future.	People: Infrastructure
5S of MUB Loading Dock Storage Room	Merchandising Operations	Various departments working in the MUB share the MUB loading dock as a resource. This space gets used for overflow of inventory as needed. There was no cleaning or organizational processes in place, which meant the space became full. On occasion, there was not enough space within the loading dock to house all the excess inventory from departments, and time had to be taken for impromptu cleaning.	Spaces were cleared and appropriate homes for items and overflow were marked. This allowed for the space to serve as an overflow, and reduced the time spent cleaning and reorganizing the area. Safety hazards due to clutter were removed. The area is now functioning as an overflow space for inventory, used by various departments without problems.	People: Infrastructure
5S of the Foundry Lab	Material Science and Engineering	Students and staff struggled to know where items belonged/didn't belong, as well as general locations of work stations. Significant time was being spent searching for necessary tools. There was an inadequate use of space that created potential safety hazards, excess inventory, excess movement, over production, over spending, and loss of valuable goods and money.	The organization process began at a student work station. Implementing the 5S workplace organization tool, space became better utilized, excess motion was eliminated, and the amount of inventory decreased significantly. A shadow board was created for tools and supplies, which made it easier and faster to locate items and/or replace them.	People: Community People: Quality of Life People: Infrastructure Education: Student Learning Education: Educational Programs

5S Paper Files and Emails	Sponsored Programs Office	Multiple offices had no order or process for the filing of papers and emails, such as which files should be kept and for how long. Unneeded files were taking up a lot of space, which made it harder to find files that were needed.	Files were sorted in order to determine which files should be kept or stored. A standard was developed to determine how long files are kept, and an audit was put in place to evaluate existing files and purge unnecessary files. A system was developed to identify actionable emails and searching tools were created in order to find emails more easily. Less time was spent on periodic cleaning and rearranging.	People: Infrastructure
Dropping Items Off at IT Service Desk	Information Technology	The IT help desk had no process for providing service information to customers who dropped off hardware that needed to be fixed. Customers received information they didn't know how to use, would become dissatisfied with the lack of knowledge regarding the status of their hardware, and occasionally customer parts were lost. The IT staff at the help desk collected very little information from the customer about who they were or what was included with the hardware. This caused much confusion for both parties and a lot of customer dissatisfaction.	A new Information Card standard was devised for information required from the customer by the Help Desk. The Information cards allowed IT to record important information from the customer, and the customer had information on the card that allowed them to check their item's progress. Better work flow processes were established to reduce item-mix ups, lost parts, and customer waiting time for the finished product. Not having to replace a customer's lost parts saved $200 per year. Overall, customer satisfaction was increased, the process efficiency was increased, and other neighboring departments adopted the information card.	People: Infrastructure
MUB Basement 5S	Auxiliary Services Operations	The MUB Basement had no specified areas for items and their proper spots. Staff had to spend a lot of time looking for items, and the space was cluttered and unusable. Employees could not always find what they needed and everyone had a different idea of where equipment should be stored. There was no process for knowing how much of an item or product was left, or how much was needed. Potential safety hazards included open fire doors and missing safety signage on high voltage equipment.	All items were designated a location, allowing employees to find needed items and complete tasks more quickly. Standards were set for inventory to ensure material needs were met at all times. Some items, such as podiums and portable bars, were moved to the area they were used, saving time and movement. Audits were put in place to ensure new processes and standards were maintained. Safety hazards were removed, reducing the likelihood of future incidents. New procedures were created for fire doors and safety signage was secured to the fire doors and the high voltage equipment.	People: Infrastructure

Ripley Kids Instructor Standards	Mont Ripley	Ski School administration and customers did not share a common understanding of the expectations, timeline of events, or policies of the Saturday Ripley Kids lesson program. Most of the Ripley Kids instructors are Michigan Tech students. There was no documentation of the program policies and procedures to deliver to the next set of instructors, and the ski instructors did not receive any training. This created unexpected absences without the ability to substitute, miscommunicated lesson plans, and customer frustration. Each year, the program hosts lessons for 20-130 children, and there wasn't a way to track each student, or to tell the ski school students apart from the general public skiers, which created a potential for the instructor to lose track of a student. Customers registered in many different ways, creating confusion and inaccurate information. Customers weren't showing up on time, or in the correct location, which forced lessons to start later.	The process was mapped using a tool called swim lanes. This involved communication between instructors, the rental shop, the ticketing office, the Ripley Kids Coordinator, the Ski School Director, and the Mont Ripley General Manager. Policies and procedures were agreed to and documented. An instructor training clinic was created to teach appropriate expectations, lesson plans, and customer service skills to all instructors. Brightly colored helmet covers were purchased in 11 different colors and one color was assigned to each group of ski-school students, which encouraged students to wear helmets while also providing instructors with a way to identify their students, even from a distance. Registration formats were reduced from five to two, and during registration parents were provided with a packet containing important program information. Overall, the time to start lessons daily was reduced from 30 minutes past the scheduled start time to an average of 4 minutes past the scheduled start time, and the number of confused families decreased from 40% to 3%. From 2017 to 2018, the overall customer satisfaction survey showed an improvement of 23%.	Education: Transformative Education Education: Student Learning People: Community People: Infrastructure
Streamlining Security Inspection Process	Facilities Management	Employees conducted security inspections in different ways, because of inadequate software and the absence of standards. Files were being corrupted as a result of the outdated software. This created duplicate work and a drawn out turn-around time, which consistently led to corrections and missed deadlines.	A checklist was implemented and a change in software allowed for the entire inspection process to become electronic. The completed checklist and the pictures are saved in the same place at the end of the inspection process. All inspections have now been completed in a timely manner. This has reduced labor costs, unnecessary disputes from tenants, and a decline in replacement costs.	People: Infrastructure

Locker Room Process	Ticketing	Ticketing staff ran into a lot of correction and duplicated work when entering locker room data into Card Services and Audience View software. The needed information was spread out across multiple areas. Employees were spending time manually creating reports to get all of the important information in the right place. Two systems were being used to complete a single transaction. People were using the lockers paid for by others.	New "day use" signs were hung in the locker rooms to designate where non-locker owners could place belongings when working out, which eliminated frustration from locker-owners over having other people use their lockers. The initial data entry format was changed to reduce steps, and has reduced the amount of time to complete a report. This eliminated duplicate work and corrections for employees.	People: Infrastructure
Allocating Faculty Time	Administration and AMP-UP	Every department on campus had their own way of allocating time/effort between research, teaching/advising, and service for faculty and reviewing performance in these roles, and not all roles were defined. Each department had to figure out how to compare their faculty for merit evaluations, as the systems did not line up. This also produced a feeling of inequality and disrespect among faculty.	Improved data collection enabled the improvement of merit evaluations for the faculty. Specification and clarification of faculty roles, through tracking and reviewing, created more complete and accurate evaluations. Faculty felt they were being treated more like equals.	People: Community People: Infrastructure
Scheduling Conference Rooms at Library	JR Van Pelt and Opie Library	Two library conference rooms use Google Calendar for scheduling. They are available to be scheduled by library employees and some outsiders, but there was no way to schedule/invite the room to a meeting.	A process was developed in order to schedule meetings in Library Conference rooms, and invite people via Google Calendar. The new process makes it possible for those looking to schedule a room to see if it has been scheduled.	People: Infrastructure
Dining Services Storage	Dining Services	Dining Services' storage space was cluttered from unneeded items and catering carts and other equipment that did not have a designated storage location. Safety hazards such as tripping and blocked exits resulted from the clutter. Work flow of the employees was disrupted because employees had to walk around to find needed carts and equipment they needed to complete tasks.	Work flow was improved by marking areas for carts and materials. Standardization of carts and materials also greatly increased the ability to provide services in a timely manner. Standardization of the location of objects reduced clutter in terms of materials, as well as eliminated safety hazards. Time spent by employees searching for carts, using the elevator, fixing carts, or placement of carts has been reduced by 60 minutes a day.	People: Quality of Life People: Infrastructure

Revamp of Departmental Purchasing Cards Process	Materials Science and Engineering	The Materials Science and Engineering Department had no efficient process for allocating purchases made with departmental purchasing cards. The office assistant spent a lot of time tracking people down to find receipts, uploading receipts, and reallocating funds. People had to be reminded multiple times, and receipts were received in many different ways, such as over email or in person. Sometimes someone used a card in a different cardholder's name, and did not keep necessary information about the purchase. Then the office assistant had to find this unidentified person and determine which purchases they made so it could be reallocated.	A Google form that required all necessary information for allocations was created, requiring a name, index, and receipt from purchase to be uploaded. This reduced paper waste to zero, motion waste to zero, and reduced the process time from 10 hours per month to roughly 2.5 hours per month. Receipts are stored on a shared drive that allows anyone to step in to do allocations if needed.	People: Infrastructure
Commencement: Volunteers	Registrar's Office	Volunteers didn't have a shared understanding of the tasks being asked of them, nor how to find out the information needed to be successful. Arena doors were staffed and maintained to accommodate the influx of parents and bags to be checked, prior to the ceremony beginning. Volunteers were reporting every detail of their work to Commencement chair holders, which wasn't always necessary. There was no procedure for a mass evacuation in case of an emergency. Sometimes, vehicles or other large objects were blocking emergency exit doors. Commencement leaders and safety personnel were indistinguishable from the crowd. Volunteers were never thanked for their efforts, even though some were present for up to eight hours.	Subcommittees were created to tackle the different processes involved in commencement, and then reported out to the larger commencement committee with updates. Thank you gift cards were approved to be handed out to every single volunteer. Safety and Commencement personnel were given vests to wear, so they stand out. Evacuation and emergency procedures were created, and volunteer packets for the volunteers were distributed. A volunteer coordinator was appointed to be the central hub for organizing volunteer training, and to answer any questions. A Central roster of all volunteers was created to ensure everybody would be accounted for in the unlikely event of an emergency.	People: Infrastructure Education: Student Learning

Commencement: Ticketing	Registrar's Office	Staff from the SDC had no shared understanding of what the official room capacity was for the commencement venue, so tickets were given out without a cap. This created limited and unassigned seating. Often tickets were given out but not collected, so anyone could potentially walk in at any time during the commencement ceremony. Graduates would buy and sell tickets amongst one another even though it was highly discouraged. There was a high level of confusion for the students and their families as to how to get tickets and how many each student would receive. Many families were entering the arena up to three hours before the ceremony started, so they could get seats together. There was an overflow area, but it wasn't being used very much.	Communication was opened up between departments involved in issuing tickets, which saved students about 200 hours/semester. Fewer emails saved about 40 hours/ semester. Fewer questions between departments saved approximately 120 hours/semester. A cap for tickets was issued, which created a higher demand for guests to use the overflow area, and it also made it easier for the ticketing staff to track tickets. Deadlines were set for students to pick-up tickets, and if they didn't, those tickets were given to students requesting more, which reduced anxiety and ticket selling.	People: Infrastructure Education: Student Learning
5S Portage Lake Golf Course	Auxiliary Services Operations	The Portage Lake Golf Course had limited space in their storage area because it was not organized and contained items that didn't belong there. The resulting clutter posed a tripping safety hazard, made worse by the presence of stairs. Employees had to spend extra time finding any items that were needed.	Organization of the storage space saved roughly 30 minutes per day for operation and saved 16 hours per year in labor costs. Safety hazards, such as tripping, were eliminated once the space was organized and cleaned up. Audits were put in place and performed daily to ensure no inventory outages or overages.	Scholarship: Economic and Social Development
Streamline Process for Lab Fee Requests	Provost	Staff spent a great amount of time correcting errors in lab fee request forms. Departments were able to submit lab fee requests in multiple different ways, which allowed for submitting incomplete or inaccurate forms, creating increased processing time, multiple submissions, and customer confusion.	A standard was created, requiring lab fee requests be submitted electronically. The majority of departments complied with this standard, but more communication is required to get all departments. The team is running multiple improvement loops to fine-tune the new process.	Scholarship: Scholarly Activity People: Infrastructure
This table contains Rapid Improvement Events selected from Item 2 in OCI Activities for Fiscal Year 2018, above.				

Office of Continuous Improvement
Table 2. Alignment with University Strategic Goals

Strategic Goal Alignment: Michigan Tech has a strategic plan which helps align the daily activities of the university. Continuous improvement using Lean principles aids in this effort.

Indicates a strategic plan subgoal supported by OCI.

University Strategic Goals Website

University Strategic Goals

Education
Provide a distinctive and rigorous action-based learning experience grounded in science, engineering, technology, business, sustainability, and an understanding of the social and cultural contexts of our contemporary world.

Student Learning: Integrate instruction, research, and innovation to achieve the student learning goals for undergraduate and graduate programs.

- Provide research, service-learning, project-based, entrepreneurial, and international opportunities for students.
- Promote mutual appreciation of, and collaborative opportunities across, academic disciplines.
- Continually assess, review, and improve programs and develop new offerings in emerging disciplinary and interdisciplinary areas.

Transformative Education: Provide a technologically-rich education grounded in a residential and experiential learning environment.

- Encourage and support high quality, innovative, and effective instruction and experiences to enhance student learning.
- Provide student mentoring, career and professional development, and leadership opportunities.
- Enhance student learning and experiences to promote long-term physical and mental health.
- Foster mutual respect in personal and professional interactions.
- Promote social and civic responsibility as well as ethical conduct.

Educational Programs: Expand programs in response to social and economic needs and challenges.

- Develop and enhance pathways to completion of undergraduate and graduate programs.
- Increase both scholarly productivity and number of doctoral and master's degrees awarded.
- Improve access via online and other non-traditional delivery of educational programs.
- Promote lifelong learning by providing opportunities for continuing education.
- Encourage understanding of public policy issues.

Scholarship
Enhance research, scholarship, entrepreneurship, innovation, and creative activities that promote sustainable economic prosperity, health and safety, ethical conduct, and responsible use of resources.

Scholarly Activity: Grow research, scholarship, and creativity.

- Increase external support for research, scholarly, and creative activities, including leadership of interdisciplinary multi-institutional collaborations.
- Promote, recognize, and reward scholarly excellence and accomplishment.
- Encourage and support entrepreneurial and interdisciplinary activities.
- Promote sharing and growth of research facilities, services, and infrastructure.

Office of Continuous Improvement
Table 2. Alignment with University Strategic Goals

	Economic and Social Development: Promote innovation and development for economic and social progress. • Advance interdisciplinary research to address problems of social significance. • Create a culture of responsible innovation and entrepreneurship. • Support workforce development and social engagement through collaborative outreach and technology transfer. • Encourage and support technology commercialization and start-up businesses. • Expand international and cross-cultural engagement with universities, industries, non-governmental organizations, and governments. • Foster social development and economic growth of our state and the local community. **People** Foster and support an exceptional and diverse community of students, faculty, and staff. *Community*: Cultivate an exceptional academic and professional community. • Recruit, support, recognize, and graduate bright, motivated, and adventurous students. • Attract, retain, and support faculty and staff and provide recognition, rewards, and competitive compensation. • Collaboratively develop opportunities for partner engagement. • Provide professional development and leadership opportunities for students, tenured, tenure-track and non-tenure-track faculty, and staff. • Optimize numbers of tenured, tenure-track, and non-tenure-track faculty and staff to foster growth of University programs. *Quality of Life*: Ensure a supportive environment for all members of the University community. • Promote equity, inclusiveness, and collegiality through openness, engagement, mutual respect, and understanding of diverse perspectives. • Increase diversity, and promote success of all students, faculty, and staff. • Provide a rich cultural environment and a welcoming campus. • Support the health and well-being of all members of the University community. • Engage with external partners to enhance the quality of life in our local community. *Infrastructure*: Provide exceptional services and infrastructure. • Promote a university-wide culture of safety, responsiveness, effectiveness, and efficiency. • Provide exceptional technology, library, classroom, and laboratory facilities that support education, research, and innovation. • Create and maintain an aesthetic, sustainable, and effective infrastructure.