# Getting things done in academia: the challenges with institutional bureaucracy and the need for project management

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*Abstract*— **This paper presents a case study at a large Midwestern university where agile project management influenced the outcome of change initiatives in an Engineering School (ES). Agile project management encompasses several skills including leadership, communication, organization, conflict management, and the ability to navigate ambiguity. While this skill set is common in many industries, it is very uncommon in higher education. By infusing this diverse way of thinking into transformational efforts aimed at enhancing the student experience, we have disrupted the traditional academic hierarchy, seen greater momentum and greater initial success, and created a new model for "getting things done" in academic organizations.**

**As part of the REvolutionizing engineering and computer science Departments (RED) grant, we aim to improve the culture in the ES. To accomplish this, we have formed grassroots teams consisting of faculty, staff, and students that launch experiments aimed at improving students' professional skills development & departmental culture. This effort has consisted of ~50 participants across 12 teams for three semesters. We did not initially foresee the level of oversight & management needed to run such an effort or the bureaucratic barriers to operationalizing the grassroots teams and experiments. In response to this environment, agile project management was introduced half-way through the first set of experiments. Through observations, surveys, interviews, and outcomes of the experiments themselves, we have characterized the impact of adding agile project management to this program.**

**Our early results indicate that progress can be expedited by an agile project management skill set, and more specifically, the number of experiments launched through grassroots efforts has increased by a factor of 7 semester-over-semester after adding agile project management. Additionally, 92% of participants reported being satisfied with the experience with an average rating of 4 out of 5. Lastly, the value that project managers add was a key theme cited in end-of-semester surveys and interviews. Our early success metrics suggest that this critical industry skill set, generally lacking in academic settings, can make a significant difference in the success of departmental initiatives. *We believe that propagating agile project management more broadly in academia can positively influence productivity and expedite the rate of change by re-thinking traditional academic methods of "getting things done".***

**Keywords—project management; re|course; REvolutionizing engineering and computer science Departments (key words)**

## I. INTRODUCTION

This paper presents a case study at a large Midwestern university where agile project management influenced the outcome of change initiatives in an Engineering School (ES). Agile project management encompasses several skills including leadership, communication, organization, conflict management, and the ability to navigate ambiguity. While this skill is common in many industries, it is very rare, if not nonexistent, in higher education. By infusing this diverse way of thinking into transformational efforts aimed at enhancing the student experience, we have disrupted the traditional academic hierarchy, seen greater momentum and greater initial success, and created a new model for "getting things done" in academic organizations.

As part of the REvolutionizing engineering and computer science Departments (RED) grant, we aim to improve the culture in the ES. To accomplish this, we have formed grassroots teams consisting of faculty, staff, and students that launch experiments aimed at improving students' professional skills development and departmental culture. This effort involved ~50 participants across three semesters driving 12 projects. Several challenges arose including lack of communication across participants and across projects, lack of tracking and documentation, and lack of follow through which led to decreased motivation and investment across the board.

An agile project manager is critical to overcoming these barriers and this paper describes how we saw greater productivity and overall greater project success after introducing an agile project manager. Based on our findings, we hope to increase the prevalence and value of this skill in higher education, especially for change initiatives.

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## II. BACKGROUND

### A. Industry context

Project managers have played a critical role in industries for the past several decades. According to the Project Management Institute, *"The project manager position on projects is critical; project managers must have full responsibility and accountability, must apply lessons learned, must define roles and responsibilities, must lead project planning and tracking, must perform risk management, must apply best practices, must communicate to the project sponsor and team, must promote client involvement, must mentor, must promote good working relationships, and must make things happen"* [1]. According to Glassdoor, the average national salary for a project manager is $80,854 [2], further proving how much this role is emphasized.

Project managers have had to evolve over time to keep up with industry trends and innovative, fast-paced companies eager to expedite progress. One such evolution is agile project managers, who are especially common in technology industries where aggressive timelines and constant change are prevalent. The Project Management Institute offers a certification for agile project management and describes these roles as the team members who "remove obstacles, facilitate team communication, mediate discussions within the team and negotiate with those external to the team. Above all, they exist in service to the team" [3].

Agile project management stems from agile software development which was created to expedite the quality and delivery of software that meets end customers' needs, even if those needs change throughout the development process. According to the Agile Software Development Manifesto, its four core values [Table I] and twelve principles [Table II], [4], [5] include several high-level skills that can be applied in a wide variety of settings, such as working cross-functionally, ongoing collaboration, adaptability, ability to navigate ambiguity, promoting sustainability, simplicity, and focusing on the customer / end user.

### B. Higher education context

Broadly speaking, project managers are not prevalent in higher education and in addition, the project management skillset is incredibly rare, if not nonexistent. There is currently a conversation presenting the case for additional project management expertise to be applied in academic environments [6], [7] but little research exists on the impact of infusing this skillset into higher education.

Change initiatives are predominantly driven by faculty today, and the faculty role is in some ways, counter-intuitive to a project manager's role. There is currently a discussion on the paradoxical nature of a faculty role. A recent article in Science states, *"Tenure-track faculty members must not only think well, but they must also write well, speak well, and interact with people well. They should have a keen business sense and be adept in managing budgets, projects, and people. Paradoxically, they must be fiercely independent, yet able to collaborate well with others. They must be confident enough to know when they've found a scientific truth, but humble enough to admit when they are wrong. They should be kind enough to mentor younger scientists, but stingy enough with their time to be able to manage it well"* [8]. By being pulled in so many opposing directions, it is unrealistic to expect faculty to drive effective project management in addition to all their other priorities. This implies that project management is not only rare in academia, but is also counter-intuitive to the way most academics are trained to operate.

TABLE I.

| Agile Software Development Core Values |
|---|
| **Individuals and interactions** over processes and tools |
| **Working software** over comprehensive documentation |
| **Customer collaboration** over contract negotiation |
| **Responding to change** over following a plan |

TABLE II.

| | Agile Software Development Principles |
|---|---|
| 1. | Our highest priority is to satisfy the customer through early and continuous delivery of valuable software. |
| 2. | Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage. |
| 3. | Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale. |
| 4. | Business people and developers must work together daily throughout the project. |
| 5. | Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done. |
| 6. | The most efficient and effective method of conveying information to and within a development team is face-to-face conversation. |
| 7. | Working software is the primary measure of progress. |
| 8. | Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely. |
| 9. | Continuous attention to technical excellence and good design enhances agility. |
| 10. | Simplicity--the art of maximizing the amount of work not done--is essential. |
| 11. | The best architectures, requirements, and designs emerge from self-organizing teams. |
| 12. | At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly. |

### C. Bringing industry to higher education

Our team hired an individual with a decade of professional experience working in the technology industry that embodied the ideals of agile project management and then applied them to our academic context. From previous experience, she shared that top priority initiatives in industry almost always had a clear project manager assigned to ensure someone is accountable for the initiative's success, that project management was a skill all employees were encouraged to develop, and that some teams

had horizontal program managers who were responsible for supporting high profile objectives across the organization.

We hired this staff member as Managing Director of an education research center and specifically for RED, her role was to help program manage the overall grant, not to intentionally manage any specific grassroots efforts. However, based on project needs, she took on overall program management of our grassroots efforts (driving program-wide recruitment, operations, communications) as well as project management of specific change initiatives (driving tasks and implementation efforts for specific grassroots teams).

## III. Case Study

### A. Grassroots team overview

Our effort to form grassroots teams is discussed in detail in "Grassroots teams for academic departments: a new way to understand culture and change" [GTAD, 9]. At a high-level, we recruited volunteers for these teams for three semesters. An agile project manager was hired to lead this effort after the first semester and this paper discusses the role the project manager played and the results after adding this skillset to our team.

### B. Project management – Semester A (Spring 2017)

When we launched the first semester of grassroots teams, no one was designated in the project manager role. Instead, the teams were facilitated by a trainer who specialized in teaching individuals on how to drive their own change projects. Given that this individual's expertise lied in training, there was no expectation for him to provide project management support, let alone agile project management support. Meetings were scheduled for each team and meeting reminders were sent; however, project documentation was not maintained. Many other aspects of project management (such as conflict management, leadership) were not implemented either.

### C. Project management – Semester B (Fall 2017)

An agile project manager was hired at the end of Semester A and ran the overall grassroots team program starting in Summer 2017. The expectation of this role was to a) drive team-wide communication, b) implement incentives for participants, c) launch a comprehensive recruitment strategy, d) maintain clear and comprehensive project documentation, and e) ensure teams were setup for success to launch change experiments by the end of the semester.

Broadly speaking, we applied agile project management by hiring an individual who previously worked in the technology industry. Using her industry perspective and experience, she applied her skillset in an academic context for the first time which allowed us to rapidly implement programmatic changes and increase experiment velocity.

### D. Project management – Semester C (Spring 2018)

We chose not to recruit any additional participants in Semester C since teams had several initiatives in progress and remained engaged at the end of Semester B. For Semester C, we continued to manage the program overall but did not engage with specific grassroots team meetings. Teams were encouraged to continue the ideas they started in Semester B and as is often typical, many of the results we saw in Semester C were the result of efforts that began in Semester B since it often takes longer than one semester to plan and launch a change initiative.

### E. Data collection

Our team collected a variety of data to measure the effectiveness of our program, including ethnographic observations, qualitative interviews, surveys, project documentation, and project outcomes. Our team of ethnographers is explained in detail in GTAD [9]. Interviews were performed with active participants at the end of the semester on a voluntary basis. The goal of these interviews was to learn more about the grassroots experience and hear first-hand recounts of how their change process went. An end-of-semester survey was also sent to understand how closely the experience mapped to training and to hear overall impressions and feedback on highlights and challenges. Detailed project documentation includes attendance, meeting notes, ongoing action items and task completion, and lightweight project plans. Project outcomes were documented independently to capture detailed reflection on what the experiment was, requirements, timelines, results, challenges, feedback, and future experiments.

### F. Grassroots team design

We formed grassroots teams consisting of faculty, staff, and students that worked on 12 change initiatives across three semesters. In total, there were 54 participants. Change initiatives were chosen by each team and focused on ways to improve students' professional skills in the ES. Some examples include: improving office hours, creating a more flexible co-op program, implementing real-time student assessment, and professional mentoring. Specific experiments varied in size and scope and include piloting a new co-op program in the ES, developing new in-class active learning activities and assessments, and piloting an alumni mentoring program.

Teams needed at least three participants, were encouraged to attend training, and aimed to launch an experiment related to their topic. An experiment is defined as any student-centered project that was achievable within roughly one semester. The goal of these experiments was to test and gather feedback on new ideas that could positively impact students' professional outcomes. The intention was to start with small tests that teams did not need permission for. This would enable them to prove viability and then iterate, expand, and scale the experiments from there. The agile project manager played a key role in driving grassroots teams' success and examples are shown in Table III. Team topics and size are shown in Table IV.

## IV. Results

Overall, we saw increased engagement, increased productivity, and increased outcomes after agile project management was added to our team. The number of experiments launched by each team is shown in Table V. Two major contributions of agile project management discussed below are a) fostering productivity and b) increasing satisfaction and feelings of accomplishments across grassroots teams. Being satisfied with your work and feeling a sense of accomplishment is profoundly important, yet often overlooked. Improving the workplace climate can lead to an increased sense of belonging, community, job satisfaction, and in turn, productivity.

TABLE III.

| Agile Project Management Role | |
|---|---|
| **Skill** | **Examples** |
| Leadership | Formalizing our team's strategy, goals, and milestones |
| Communication | Clarifying next steps and documenting decisions to prevent teamwide misunderstandings |
| Organization | Maintaining extensive grassroots documentation and improving overall tracking processes |
| Conflict management | Proactively mitigating potential conflicts and hurdles to increase likelihood of success |
| Navigating ambiguity | Upward management of senior stakeholders to mitigate approval roadblocks |
| Focusing on the customer | Identifying cross-functional partners and keeping the ultimate end goals in mind |

Our early results indicate that progress can be expedited by an agile project management skill set, and more specifically, the number of experiments launched through grassroots efforts has increased by a factor of 7 from Semester A to Semester B and a factor of 12 from Semester A to the combined results of Semester B & C after adding agile project management. Even after removing the outlier (Conceptual Understanding experiments) in Semester B, agile project management contributed to 15 experiments launching, compared to just 2 experiments launching in Semester A.

Additionally, 92% of participants reported being satisfied with the grassroots team experience with an average rating of 4 out of 5. Given that participants were volunteering for this effort and working outside their standard job functions, we were expecting a more tepid response. In an end-of-semester survey, one participant mentioned "It really helps to have someone there to moderate the meeting and keep it moving forward," and another added that the team leaders "provided fantastic leadership!" Yet another added that this effort was a "great experience." Overall, we were pleasantly surprised with the increase in enthusiastic responses since meeting attendance and participation in Semester A had previously dropped off. This indicates that project management not only added organization and kept tasks moving, but also made a tangible impact on the teams' sense of accomplishment, recognition, and commitment.

In an end-of-semester interview, one participant commented on team leadership in Semester B compared to Semester A: *"But yeah, a lot of that's just good leadership. If you have a good leader that keeps you on task and keeps everyone on the same track, I think that you need that. That's essential for all teamwork really. I think we had that on some level. We would always wander off, but we would generally come back. That was better this semester than the first one, and I don't know why that is."* Another participant commented, *"And [the project manager] got a round of applause in one of the meetings, right? When we talked about how much she's helping our team, right? So everybody sees the value of what she's doing."* This leads us to believe that agile project management, including leadership, communication, and facilitation, was one of the key components in driving team enthusiasm, engagement, and productivity.

Agile project management has also mitigated bureaucratic obstacles, including: a) the massive amount of effort it takes to coordinate and schedule meetings using suboptimal tools and processes in our organization, b) running efficient meetings, including clear agendas, documenting decisions, and following up on agreed upon tasks, c) maintaining momentum in the face of inertia, d) finding workarounds for legacy processes that hinder progress, and e) having the emotional intelligence to proactively manage conflicts that arise, especially regarding roles and status. Additional details are described below.

### *A. Sheer amount of effort*

Our team underestimated the amount of effort it would take to manage a program of this size. Based on our experience, it would take at least 0.5 of a full-time staff member, with a specific agile project management skillset, to manage the program on an ongoing basis. This was not originally foreseen or planned for. The sheer volume of logistics and coordination alone resulted in sending over 500 emails to participants. Without a project manager, many of these details would have fallen through the cracks, and having a dedicated team member responsible for managing this effort made a significant difference in overall team productivity. The question of how to plan for, support, and sustain this level of investment is important when considering long-term viability of these efforts.

### *B. Running efficient meetings*

The project manager introduced a number of best practices for running meetings, including: having a clear agenda, ensuring a quorum of attendees are able to attend, facilitating and guiding team discussion, defining clear next steps, documenting decisions, and following up afterwards. Again, these practices are common in many industries but have yet to infiltrate academia. An article in the Chronicle of Higher Education states, *"And then I go to a committee meeting. By the end of it, those feelings of optimism and renewal are but a distant, bitter memory. Lamentations about meetings are a constant presence in academic conversations. Who among us hasn't wailed something along the lines of, 'If I didn't have all these damn meetings, I could actually get some research / writing / grading / anything done?' As one of my colleagues often laments, 'They're meeting us into submission'"* [6]. Many of the participants that volunteered on our grassroots efforts assumed that our meetings would function much like standard committee meetings where they were not expected to take action outside of the meeting, follow a clear agenda, or arrive at a clear consensus. Having a clear meeting structure helped build credibility and trust among team members and increased overall investment.

### *C. Maintaining momentum*

Project organization, efficient meetings, and managing details help maintain momentum. More specifically, following through on decisions, addressing issues as they arrive, and proactively mitigating concerns sustain momentum. For example, on the co-op team there were several external stakeholders that needed to approve changes. The project manager proactively identified each stakeholder group, ensured at least one team member was managing communication with each stakeholder, and reached out for other cross-functional team input (such as marketing). This proactive approach set the team up for smooth approvals later on in the semester.

*D. Finding workarounds*

An agile project manager is accustomed to moving quickly and finding workarounds to remove barriers. With our grassroots efforts, one of the main challenges was encouraging team members to frame the problem and experiment appropriately. For example, for the co-op team, they were initially envisioning a large-scale, program-wide change but the project manager was able to identify a smaller, more manageable pilot that could launch relatively quickly to allow for feedback and data gathering at least a semester earlier. For the student assessment team, the team initially wanted to tackle large, School-wide cultural change and was unsure where to start. The project manager was able to carve out specific pilots aimed at improving the experience in one classroom (to start) which was fully owned, controlled, and implementable by the grassroots team members. For the program overall, the project manager was able to work with university business offices to improve the project's finances and purchasing processes. Overall, at many levels, project management was able to expedite progress and unblock bureaucratic hurdles.

TABLE IV.

| **Grassroots Teams Participants** | | | | | |
|---|---|---|---|---|---|
| **Semester A** | | **Semester B** | | **Semester C** | |
| **Team** | **Participants** | **Team** | **Participants** | **Team** | **Participants** |
| School Culture | 7 | School Culture | 3 | School Culture | 3 |
| Office Hours | 8 | Co-op | 9 | Co-op | 7 |
| Undergraduate Research | 10 | Student Assessment | 4 | Student Assessment | 4 |
| Lunch with Students | 4 | Alumni Mentoring | 6 | Alumni Mentoring | 6 |
| | | Intercultural Competency | 3 | Intercultural Competency | 3 |
| | | Conceptual Understanding | 2 | Conceptual Understanding | 2 |
| | | CATME | 4 | CATME | 4 |
| | | Gradescope | 4 | Gradescope | 4 |
| | | TA Quality | 5 | TA Quality | 2 |

TABLE V.

| **Grassroots Teams Productivity** | | | | | |
|---|---|---|---|---|---|
| **Semester A** | | **Semester B** | | **Semester C** | |
| **Team** | **Experiments** | **Team** | **Experiments** | **Team** | **Experiments** |
| School Culture | 1 | School Culture | 1 | School Culture | 0 |
| Office Hours | 1 | Co-op | 0 | Co-op | 3 |
| Undergraduate Research | 0 | Student Assessment | 3 | Student Assessment | 1 |
| Lunch with Students | 0 | Alumni Mentoring | 0 | Alumni Mentoring | 1 |
| | | Intercultural Competency | 0 | Intercultural Compentency | 2 |
| | | Conceptual Understanding | 9 | Conceptual Understanding | 1 |
| | | CATME | 0 | CATME | 2 |
| | | Gradescope | 1 | Gradescope | 0 |
| | | TA Quality | 0 | TA Quality | 0 |
| **Total** | **2** | **Total** | **14** | **Total** | **10** |

### E. Emotional intellgience to navigate hierarchies

Especially in academic environments, it is critical to understand the inherent hierarchy and status that exists among faculty, staff, and students and in turn, the barriers that it can bring to collaboration. For the grassroots teams, we aimed at challenging the status quo and encouraged team members to "leave their titles at the door" to ensure that all contributions were heard and included so that the most robust and well thought-out solutions could be considered. The project manager played a key role in ensuring that team discussions were as collaborative as possible by a) clarifying next steps and decisions as they arose to ensure the entire team was comfortable moving forward, b) asking probing questions on hurdles and challenges to ensure that any concerns were brought to the table as early as possible, and c) asking specific team members for their thoughts, especially those that were not as vocal. Altogether, this approach aided in overall team inclusion, investment, and productivity.

Overall, the value that project managers add was a key theme cited in end-of-semester surveys and interviews. Our early success metrics suggest that this critical industry skill set, generally lacking in academic settings, can make a significant difference in the success of departmental initiatives. *We believe that propagating agile project management more broadly in academia can positively influence productivity and expedite the rate of change by re-thinking traditional academic methods of "getting things done."*

## V. Conclusions

In summary, the preliminary results of this case study indicate that agile project management can have tangible impacts on a higher education institution's ability to drive change, increase productivity, and boost job satisfaction. Such impacts could be broadly applicable to not only how high priority initiatives in academia are run, but also with funding agencies encouraging this role for large-scale initiatives, especially those related to change projects or those that have strong implementation requirements.

## VI. Future Directions

Future research will center around other team dynamics and factors that affect team productivity as well as challenges to applying agile project management in an academic context. For example, the question of ownership, accountability, decision-making, and in general how to distinguish a project manager from a principle investigator are important avenues to explore going forward. In an industry setting, project managers are accountable for the success of a project and empowered to drive key decisions related to that project's success. In higher education, these clear lines of responsibility become blurry when a principle investigator is actually the one responsible for a project's outcome and decisions that affect the team's results. Due to the traditional academic hierarchy, it is critical to understand the unique role that project managers can play and in turn, the boundaries of that role.

Limitations of this case study include our inability to isolate the pure impact of agile project management. For example, other team factors changed between the two semesters such as team composition, project type, and team expectations. Although the project manager was involved in those decisions and drove those pieces of the program, it is difficult to determine what effect those other team factors played when isolated from overall project management. Secondly, the skillset we hired had specifically worked in the technology industry on agile projects and teams. Thus, it is difficult to determine the effects of agile project management vs traditional project management. We believe agile project management plays a unique role in driving change initiatives due to the nature of innovation and emotional impact of change, especially in a traditionally slow-moving environment. However, future studies should examine a variety of project management skillsets to determine productivity impacts across contexts.

Lastly, our team is interested in examining how agile project management can add value to other areas of academia. For example, we would like to understand the impact of project management on traditional committees, strategic planning efforts, and in running departmental meetings. We look forward to further experimentation, to applying this skillset in new settings, and to identifying additional opportunities where industry experience can add value to higher education.

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