

Project Manager Transition: A new skill set for managing large and complex projects ^{1, 2}

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ABSTRACT

As projects grow in size their level of complexity grows exponentially. History has shown that many project managers struggle to deliver larger and more complex projects while others transition successfully.

Project managers typically follow a similar initial career trajectory; learn key techniques and tools, deliver small projects under supervision. Over time they are trusted with larger and larger projects as they demonstrate success with the smaller ones. Progress continues until the individual starts to struggle and supervisors limit coaching to reiterating the basic tenets of project management. Why do only some project managers continue their success with large and complex projects? What do those who are successfully with large project do differently?

Successful managers of large and complex project transition to executive level management, leaving behind those colleagues who continue to focus on project administration. Specifically they; loosen their grip on project detail, there is too much in a large project. They organize autonomous but accountable work streams. They focus on where challenges are most likely to occur, recognizing that organizations are an integrated web of sub goals. They also anticipate there will be constant changes develop plans that are flexible. All these skills enable the successful project manager to reduce the time spent on tactical project administration and so they can spend their time working strategically to preempt potential issues.

THE CHALLENGE OF SUCCESSFULLY MANAGING LARGE PROJECTS

Over the last 30 years I have observed hundreds of project managers and thousands of projects. The majority of these efforts have been well organized and delivered successfully. However, an analysis of these projects has shown that the success rate declines as the projects get large and more complex. Literature that describes big project failure is widely available and makes compelling reading. Examples such as: Mars Climate Orbiter⁽¹⁾, Denver Airport Baggage Handling System⁽²⁾, and Westpac CS90⁽³⁾. To be fair, there are many large, complex projects that

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are delivered successfully. So, this raises a question, why do some project managers transition to large projects successfully while so many others begin to flounder as complexity increases?

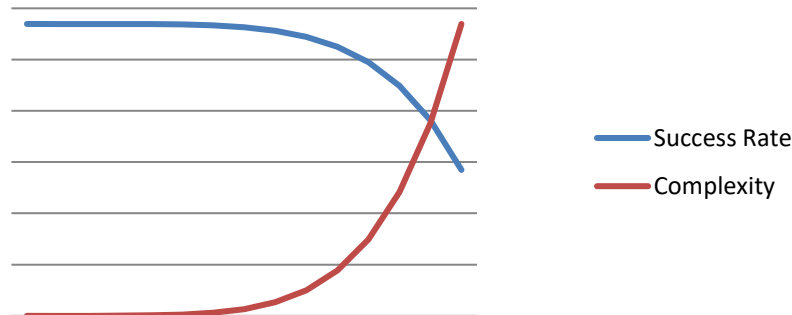


Figure 1: Success rate diminishes as complexity increases

THREE STAGES TO STRUGGLING WITH LARGE PROJECTS

Typically, a project manager's journey starts at a junior level. A personal choice of career direction combined with an organizational need to guide discrete bodies of work through successful delivery. The individual will receive training in core project management techniques. The training may be anywhere from in-house coaching to full certification from an organization such as the Project Management Institute.

Stage 1: Managing small simple projects

Initial assignments will encompass small projects, likely self-contained within a single part of the organization. The enthusiastic new project manager will create a detailed Work Breakdown structure often with tasks down to durations of an hour, predecessors for every task and a constantly updated percent complete field. This is all good. The supervisor of the new project manager constantly emphasizes managing the detail.

The initial projects are all a success with the new project manager on top of every detail. I equate this to juggling with two tennis balls, it needs some coordination but is not too difficult.

Stage 2: Managing more complex projects

As the project managers' reputation for success grows so does the complexity of the projects they are asked to manage. Projects will grow in size and complexity. The projects will include resources from other organizations, may involve more complex technology and will generally have more moving parts. The project manager continues to utilize the core techniques and seeks to stay on top of the detail to ensure everything happens per the plan.

Project managers are still successful, but it is becoming much harder. The project plan needs to change frequently to account for better understood requirements and stretched due dates. There are more relationships to manage some of which become contentious. Staying on top of the detail

becomes a time sink. Supervisors tend to reiterate by the book techniques focused on managing the detail.

I equate this to juggling 3 balls, with the occasional superstar managing 4 or 5. Even the skilled juggler begins to find their limit.

Stage 3: Tackling large and complex projects

With the success on smaller projects the project manager is asked to take on larger higher profile initiatives. Detail plans are created but they take a lot of time to maintain with constant updating as things move and shift. A lot of the project manager's time is spent chasing and understanding status, communicating status and reacting to concerns. The project manager tries to monitor all elements of the project but struggles as there are so many stakeholders and moving parts. Inevitably one or more teams are always late with their deliverable. That team's prioritization of the project seems to have shifted since early commitments to the effort.

At this point the project manager who is new to large and complex projects is working harder than ever but experiencing failure with no real understanding of the cause. As this happens they see other senior project managers calmly managing smooth projects. What are they doing differently?

PRINCIPLES FOR MANAGING LARGE AND COMPLEX PROJECTS

Foundational project management skills and techniques remain important irrespective of the size of the project. However, other executive management attributes become critical for the successful managers of large and complex projects.

1. Heisenberg Principle⁽⁴⁾: Loosen grip on project details

The Heisenberg Uncertainty Principle states that you can never simultaneously know the exact position and the exact speed of an object, the act of measuring a particle's position changes its momentum.

This principle also describes one of the challenges of managing large and complex projects. As discussed above, complexity grows exponentially as the size of a project grows.

The effort to measure the status (or position) of a project accurately takes an increasing amount of effort. With a project that is small, the effort should be minimal. However, as projects grow in size and become exponentially more complex, the effort to measure the status accurately takes an increasing amount of time. This can be the project manager's finite availability of time which has an opportunity cost. Alternatively, the status measurement effort could be delegated to the resources actually doing the work in which case they have less time to do the work. Either way, trying to accurately measure the status of a large/complex project will slow it down. The reduction of momentum can lead to failure to deliver on time, on

budget, with quality or full features.

Successful managers of large projects have learned that they cannot know exactly what is happening across a project. They loosen their grip on the details and enable the project to build momentum. To be successful they need to manage two things:

- How to recognize and head off potential issues, which is discussed in the bullets below; and
- How to provide senior stakeholders with confidence that the project will be delivered on time. Senior level stakeholders must also have the managerial maturity to not micro-manage to the detail.

Successful management of large and complex projects requires executive leadership rather than tactical management to detailed plans.

2. Autonomous but accountable work streams

As Project Managers cannot measure every detail of large projects, they need to delegate to leaders who can oversee logical sub-components of the work or work streams. The work stream(s) must be able to function autonomously where the leader has the autonomy to make decisions but is firmly accountable to the broader project or program.

If you have ever observed a popular ski hill on a busy winter weekend, you will have noticed it full of skiers. The interesting thing is that all the skiers' function independently without crashing into each other or skiing off the side of the hill. Where there is an occasional crash, the other skiers automatically adjust as the fallen skier gets up and continues on their way.

Now imagine a ski hill where the manager wants to control each and every skier - Shouting "Skier one, go; Skier one, turn; Skier two, go; Skier two, turn; Skier one, turn; Skier three, go". It would not be long until a command could not get to a skier in time! A micro-management solution to this would be to place managers on each side of the hill who could relay imminent issues to the newly promoted senior manager at the top. Soon a coordinator would be needed to take the messages from the hill side. The approach would be very expensive to operated, would have very low capacity and would likely be no fun what-so-ever to ski.

The ski hill represents an excellent analogy for the need to have autonomous, but accountable project work streams. Like the skiers, the work stream leads know the overarching operating norms and governing rules and can react quickly to any incident. They only need to escalate an issue that will likely impact the broader project or program. The large program lead needs to define the rules, manage exceptions and utilize most of their time to focus on strategic issues facing the project.

3. Focus on where challenges are most likely to occur

A manager of a small to medium sized project, trained to manage the detail, will likely split their time evenly between the components of a project. So, if there are 4 elements the project manager would allocate 25% of their time to each. As the size of project they manage grows, say to 10 elements they would allocate 10% of their time to each. Being spread so thin they would likely miss the warning signs as one element sinks into trouble.

A useful way to look at this would be a fire department on the edge of town. The neighborhoods are well served with fire hydrants however the district includes a dry woodland that does not have access to water. In that situation the fire department would likely focus more on preventative measures for the woodland such as positioning a water tanker nearby and taking various steps to raise fire awareness during the dry months. The manager of large project will act in a similar way.

The successful manager of large projects must assess each element of the project. The assessment criteria would include previous experience of the team or manager, knowledge of other organizational priorities, an understanding of the complexity of each element, and an understanding of how interconnected a given element is to the overarching project or program. Once the assessment has been done the manager of large projects will focus on the work stream likely to have issues. In a project with 10 work stream that could be 5% of their available time on each of 9 work streams and a full 55% focus on the potential trouble spot. I like to call this asynchronous focus.

4. Recognize interconnected sub-goals

At the start of a project it is usual to gather key stakeholders and establish commitment to the project team. I like to utilize the tools from Lencioni's 5 dysfunctions of a team⁽⁵⁾. The inexperienced project manager will likely leave it at that having checked the box for Project Kick-off Meeting,

The role of manager of large projects is a more challenging one because their projects will likely include a greater number of partners and those partners will come from a greater number of organizations, both internal and external. Each of the team members actually reports to a line manager whose performance is ultimately assessed based on the goals given by their line manager. The project manager ultimately can only influence behavior. The commitment provided by the project team members will always be subject to the prioritization of that individual's line management. This can show up as missed project work stream deadlines as the project team members have their priorities adjusted to meet their line organizations shifting priorities.

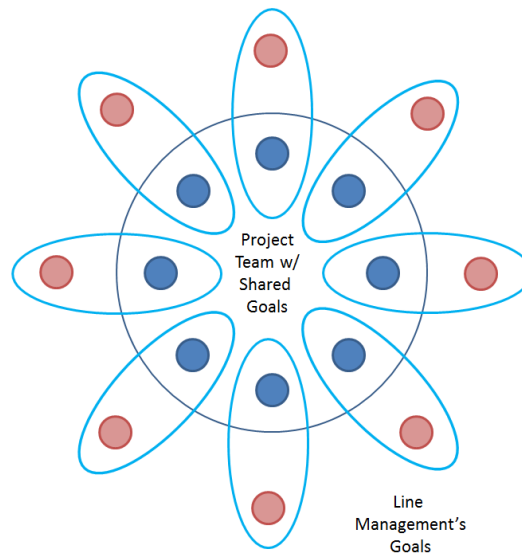


Figure 2. Project goals vs. Line Management goals

Shifting stakeholder priorities are more likely to be an issue in large project as there are typically more work streams and those work streams will sit throughout an organization and likely to 3rd party organizations.

The successful manager of large projects needs to recognize the fact that project team members will be members of multiple teams. Time will be invested to establish relationships with the senior management of work stream leads. Strong relationships will enable the project manager to have an improved understanding of the dynamics of the organization and be better positioned to advocate for their project. Appropriate insight and influence will enable the project manager to head-off any potential shifts in priorities or if needed socialize the impact to the project from the changes.

5. Anticipate changes with flexible plans

General Eisenhower was quoted⁽⁶⁾ as saying “Plans are worthless, but planning is everything”. Mike Tyson said it more colorfully⁽⁷⁾ “everyone has a plan until they get punched in the mouth”. However, Sun Tzu articulated⁽⁸⁾ it most eloquently “Those who are victorious plan effectively and change decisively. They are like a great river that maintains its course but adjusts its flow... they have form but are formless. They are skilled in both planning and adapting...”

Creating a project plan is usually the first activity in any endeavor. Project managers are taught to identify and breakdown every task, estimating the resources required and elapsed time. All the tasks are sequenced, slack time may be built in (but this is usually the first casualty of initial management reviews). As projects get larger, the inter-connected nature of the work creates enormous complexity in the plan. Then as suggested by Eisenhower, Tyson and Tzu, things change.

A task turns out to be harder than thought or a resource is not available as planned. The plan needs to change and be updated. The challenge is that in large projects, the volume of changes drowns the project manager who is not able to keep up (and certainly can't spend the required time on strategic items, leading to further changes in the future).

So what do successful managers of large projects do? First, they recognize that over time every project is fluid and will need to adapt to unknown events. Given they know the plan will change, they create a plan from the start that guides the project rather than dictates every detailed action.

Second, the lead project manager can modularize the plan. Key milestones are established. The interfaces between work streams are identified. Within a given work stream leaders are allowed to make quick decisions as long as they do not move beyond established guide rails. The local work stream leader is best placed to adapt to changes within their accountability and take local action to prevent a change impacting a program milestone or an interface with other work-stream/components.

A simple example of this is change control. On a \$10m project changes involving less than \$10k are not significant and a work stream lead should have the authority to self-approve and report. Many small changes will cancel each other out so there is no need to react to every single one.

ADDITIONAL PRINCIPLES FOR MANAGING LARGE AND COMPLEX PROJECTS

While there isn't room here, there are five additional principles that are important for project managers to transition successfully to managing large and complex projects.

- **Match Communication to the Audience**
Proactive communications tailored to the audience will minimize time spent reacting to requests for clarification.
- **Optimize the output**
Move focus from micro-managing project spend to optimizing the output. Cost and value are different.
- **Many levers to pull**
Delivery of maximum value in a complex and dynamic environment requires a balance of elapsed time, cost and functionality.
- **Lead leaders**
Invest time in developing followers into leaders.
- **Enable coexistence of project management methodologies**
There are many approaches to managing projects. Success with large and

complex projects requires the ability to apply the best methodology for each situation and integrate methodologies seamlessly.

TRANSITIONING TO SUCCESSFULLY MANAGE LARGE PROJECTS

As projects grow in size their level of complexity grows exponentially. If a project manager's skills grow in a linear fashion, they will eventually reach the point where they are not equipped to be successful.

Most people can juggle 2 balls, a good juggler can manage 3, 4 or even 5. A great juggler may even manage to keep 10 balls in the air. However, as a technique for keeping balls in the air juggling will eventually fail. Failure may come at any point, but we know for sure juggling won't keep 100 or 1,000 ball in the air.

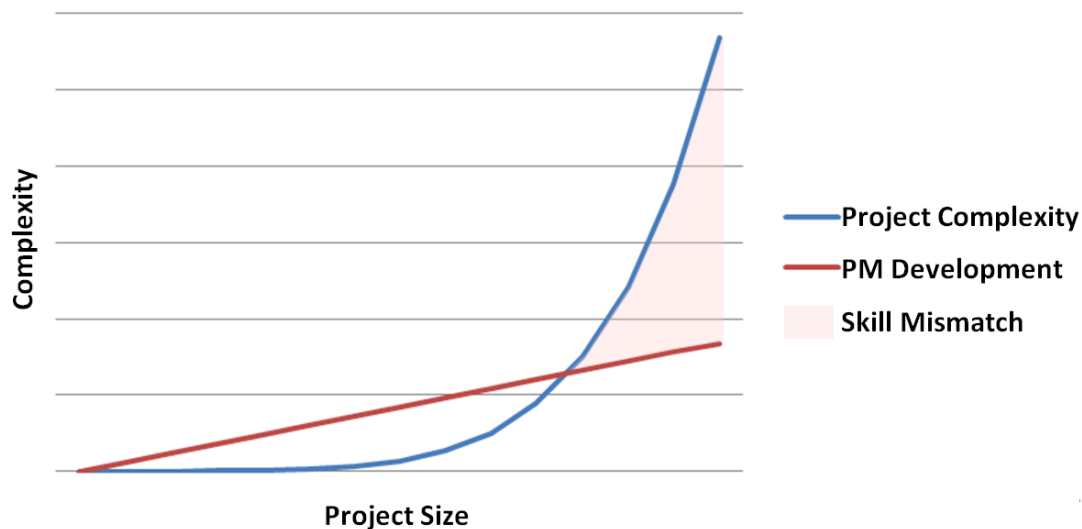


Figure 3. Gap between PM development and Project Complexity

Five principles have been identified that a project manager will need to master if they are going to successfully deliver highly complex projects.

1. Loosen the direct grip on project detail, complexity grows exponentially, and it is not possible to micromanage once a project reaches a certain size.
2. Organize into autonomous but accountable subgroups/work streams create structure at the interfaces
3. Analyze the project environment and focus where issues are most likely to occur.
4. Understand that even committed project team members will also have direct line managers. Know the demands placed on each of them to ensure there are no surprise shifts in priority that can impact the project.
5. Build project plans that are flexible, the business environment is dynamic. Avoid falling into a tactical role as project plan administrator.

In conclusion, we teach project managers to manage detail. Frequently individuals who are good at managing the details get promoted and reinforce behavior that delivered success with medium sized projects. However, to be successful with large complex projects and programs a project manager needs to become a strategic thinker, developing techniques that free up time. Time is required to get ahead of tactical issues clearing the path for project teams to deliver effectively.

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Richard Wyatt is the Director of Strategic Programs at TIAA, a leading Financial Services provider. He has worked across the globe in UK, US, Australia and Indonesia delivering project of growing size and complexity. He currently manages projects with budgets in excess of \$100m. During his career he has observed project managers struggle and the size of their project increase and has researched and articulated the skills set required to be successful. Richard has a BA in Computing in Business and an MBA from Durham University, UK.