Managing the Project Pipeline

Understanding the business physics of managing multiple projects and
Project Portfolio Management

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Agenda
• The key takeaway from today’s talk
• Group experiment
• Linking the experiment to the real world
• Theory (math and graphs)
• Application of theory and research
• Addition resources on the topic

Key takeaways:

• Project Management is the:
  ___________________ of ________________

• If your project pipeline is clogged,
  all projects __________________________

• Clogged pipes are messy; they prevent you from being
effective at: __________________________
Besides managing change effectively, project identification, prioritization, and selection, or what we’ll call managing the project pipeline, may be the most important activity of a project sponsor. Like all processes, there is no one right way of doing it and the approach taken should be refined and improved over time. The approach has 4 different phases:

1. **Idea Generation**: The goal of this phase is to not only generate a large list of project ideas to choose from, but to also make sure that the important stakeholders have a voice in the generation of ideas. Generation of a large list helps in reducing the chance that an important project idea isn’t forgotten or shared and not considered in the second phase.

2. **Prioritize and refine**: The goal of this phase is to have an agreed upon approach for sifting the out the “vital few” projects from the list of many. Frequently project sorting, scoring, and/or comparison occurs in this phase, and it’s important to be thorough but NOT allow analysis paralysis. Too much time spent in this phase takes away from actually working on the projects you’d like to see completed.

3. **Select and assign**: In this phase an approach needs to be developed for final selection of the best projects moving forward, and consideration for how the selected projects will affect other on-going work.

4. **Prune the active pipeline**: Projects are temporary endeavors and should not last forever. Also the rational for choosing a project in the past may no longer be as important if changes to customers or the organization has occurred. Periodic review of active projects with an emphasis on closing and harvesting benefits, or placing on hold or removing the project from the pipeline for other more important new projects shouldn’t be avoided, it will only slow down all the ongoing project work activities.
Organizational PM Capability and the Project Pipeline
Project Management can help individuals and organizations succeed, however it’s not a silver bullet for overall effectiveness. We find that organizations evolve in their “project management minded-ness” and the first three stages lead to problematic pipeline shown above.

- **Stage 1:** Ad Hoc Informal Project Managers
  Put a technical person in charge of projects with no formal training in project management

- **Stage 2:** Intentional Formal Project Managers
  Provide formal project management training to understand the human and technical elements of project management.

- **Stage 3:** Standardized Project Management
  Use PM framework, metrics, tools, and templates so the organization has standard procedures in place for the work of project management

Only after the organization succeeds at the fourth stage does the pipeline problem begin to resolve itself:

- **Stage 4:** Enterprise Project Portfolio Management
  Select/prioritize/manage the best mix of projects
Group exercise: flow, throughput, wait times

Directions:
• Stay within the course
• Finish the tasks required
• Don’t run, push, or be rude

Goal:
• Get done on time, within budget, meeting the needs of your most important stakeholders (me)

Applying the exercise to the real world
Little's Law states simply that for any steady state system that has flow through it:

\[ L = \lambda \times W \]

Where:
- \( L \) = average number of items in a queuing system
- \( \lambda \) = average number of items arriving per unit of time
- \( W \) = average waiting time in the system for an item

It can also be stated as:

\[ \text{WIP} = TH \times CT \]

Where:
- \( \text{WIP} \) = Work in process or the inventory between the start and end points of a production routing
- \( TH \) = Throughput or the average output of a production process (machine, workstation, line, or plant) per unit of time
- \( CT \) = Cycle time or the average time from release of job at the beginning of a routing until it reaches an inventory point at the end of a routing. Sometimes cycle time is called flow time or throughput time.
Terms related to Little’s Law:

**Capacity:**
Ability to produce or do that which the customer requires. The ability to produce work in a given time- measured as *unit of work*

**Utilization:**
The proportion of the system's resources which is used by the traffic which arrives at it

**Capacity Utilization:**
The percentage of the capacity of a device or system that is being used productively. The efficiency of staff, equipment, and facilities, etc.

**Efficiency:**
The ratio of the output to the input of any system

Capacity Utilization (the x-axis of the graph above) can be modeled with three variables understood:
- A/R = arrival rates of requests into the system,
- S/R = service rates of the requests coming into the system,
- N = the number or amount of resources available to service requests

As capacity utilization increases to 100%, the total time a request spends in the system, measured as lead time, rises exponentially. Lead time is the y-axis of the graph above.
Some relevant recent research on the topic of project pipeline performance and variables to consider beyond the Little’s Law model:

“Resource-constrained multi-project scheduling: Priority rule performance revisited”
Abstract: “we conducted a comprehensive analysis of 20 priority rules on 12,320 test problems generated to the specifications of project-, activity-, and resource-related characteristics including network complexity and resource distribution and contention. We found several situations in which widely advocated priority rules perform poorly. We also confirmed that portfolio managers and project managers will prefer different priority rules depending on their local or global objectives.”

“The effectiveness in managing a group of multiple projects: Factors of influence and measurement criteria”
Abstract: We found the organizational-level and operational-level factors influencing the effectiveness in the management of a group of multiple projects (MGMP) and the criteria for measuring the MGMP effectiveness. This finding was organized as a framework underlying the effectiveness in MGMP, providing important managerial implications and suggesting potential future research.
Project Portfolio Management (PPM)
“A project portfolio is a collection of projects or programs, within investment targets, that grouped together to facilitate effective management of that work to achieve corporate and business strategies” – Project Management Institute

Evidence based suggestions for effective PPM
1. Excellence at individual level PM before portfolio PM
2. Measure some of the critical variables discussed earlier
3. Prioritize based on organization strategy AND fit with available resources
4. Manage the pipeline and have a project kill-rate metric
5. A small change in resource allocation MAY have a great impact on completion time
6. Create better organizational communication, collaboration, and rewards for performance
When scoring project success, organizations evolve in their approach toward defining what is success.

• Level 1: Project Management Success—Was the project done right?
• Level 2: Program Project Success—Was the right set of projects done?
• Level 3: Portfolio Project Success—Were the right mix projects done right, time after time?

For effective portfolio management, organizations typically score projects along a business value dimension as well as a project deliverable dimension, and variables of each may include:

<table>
<thead>
<tr>
<th>Business Value</th>
<th>Project Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alignment to strategy</td>
<td>Degree of complexity</td>
</tr>
<tr>
<td>Tangible benefits (profit, rev, ROI, etc)</td>
<td>Size of effort</td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>Number of interdependencies</td>
</tr>
<tr>
<td>Competitive advantage</td>
<td>Variance to budget</td>
</tr>
<tr>
<td>Innovation and new capabilities</td>
<td>Effectiveness of risk management</td>
</tr>
</tbody>
</table>

Scoring Model diagram adapted from Dinsmore, Cooke-Davies. *The Right Projects Done Right*. 2006
When the organization reaches stage 4, they systematically look at projects as investment vehicles that help deliver value to their most important stakeholders. New focus is given to managing not just individual projects, but rather the pipeline of interrelated projects.

Questions that are answered when managing this pipeline:

• What is the viable project mix, one that is capable of meeting the goals of the organization?
• How do we manage throughput throughout the pipeline, and balance the portfolio, to ensure a mix of projects that balances short term vs. long term, risk vs. reward, research vs. development, etc.?
• How do we monitor the planning and execution of the chosen projects
• Are we analyzing throughput and portfolio performance as well as looking for ways to improve it?
• When are we evaluating new opportunities against the current portfolio, taking into account the organization's project execution capacity?
• How effective are we in leading upward and providing information/recommendations to decision makers at all levels?
Key takeaways:

Project Management is the:
__________________________ of ________________

If your project pipeline is clogged
all projects ____________________________

Therefore, understand the variables that affect pipeline performance: A/R ____________________
S/R ____________________
n ____________________

Clogged pipes are messy; they prevent you from being effective at:
__________________________

Wisconsin School of Business & Master’s Certificate in Project Management—
https://www.uwcped.org/courses-certificates/certificates/project-management-certificate

Web site with materials—
Little’s Law
Resource constrained multi-project scheduling
Factors in managing a group of multiple projects

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