Creating your Roadmap

The Importance of Developing Effective Milestones and Project Management

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Remember how your scientific training began.

- What was your first project?
- How did you start working on it?
- How did you decide when the project was complete?

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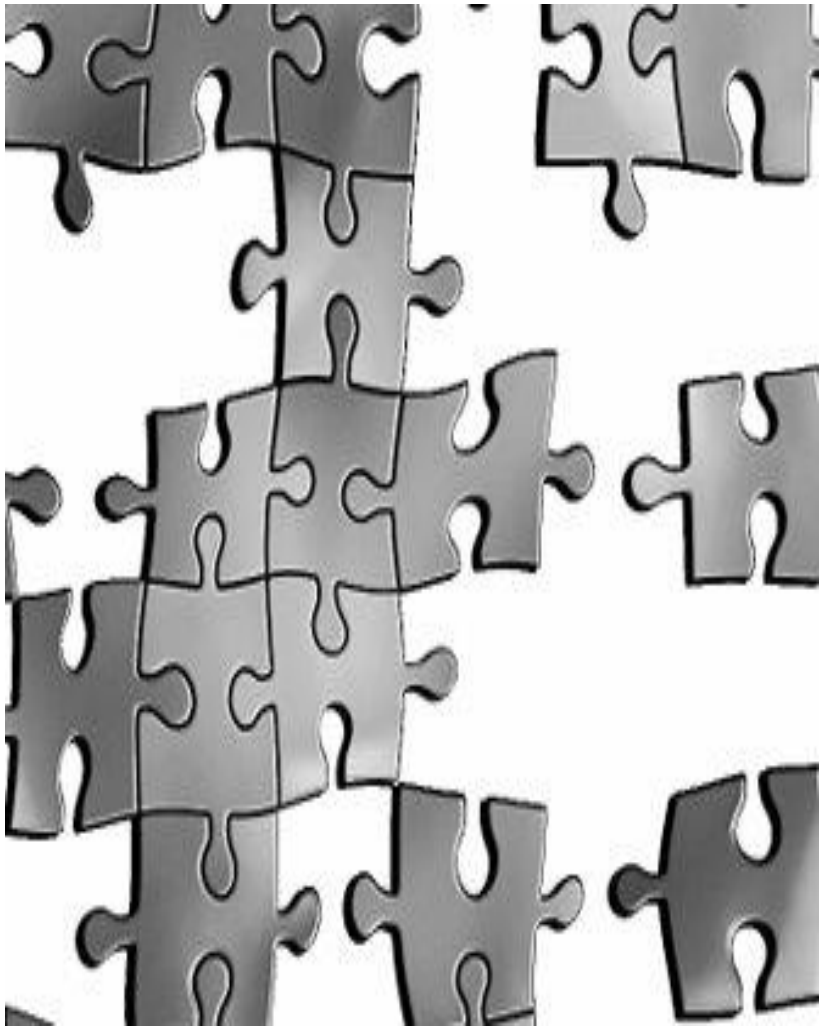
The lack of a clear plan creates gaps in understanding.



How can this happen?

1. No agreed upon **expectations** for project work

2. No agreed upon **milestones**

3. "**Scope creep**" - project reaches an unintended (undesired) goal

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Why Plan?

"In preparing for battle, I have always found that plans are useless, but planning is indispensable."

Dwight D. Eisenhower

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Specific actions and behaviors support the development of an effective project plan.

Plan to plan

Focus on decisions and dependencies.

Define (and refine) your goal

DO plan open project discussions

Identify, engage, and listen

DO NOT build silos.

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Start by a defining a **single** project goal

Address motivation

What is the purpose of this project and who are the stakeholders?

Address knowledge gaps

What do you know, *what do you not know*?

Know your project limitations

What are your time and resource constraints?

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Define what success looks like

Scope

Scope includes your goal plus time and resources (budget, equipment, number of people working).

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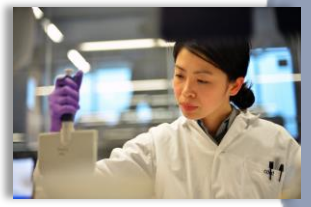
Create a project plan with information from multiple perspectives.

Technical information

Non-technical information



Material selection
Component choices
Prototyping
Experiments
Animal studies
Clinical trials

Market analysis
Barriers to adoption
Regulatory strategy
Reimbursement
Supply chain
Marketing plan

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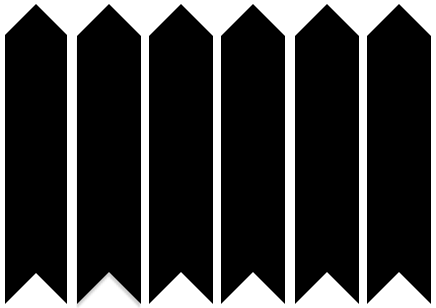
Identify the knowledge gaps

Technical data?



Intellectual property?

Regulatory strategy?

Clinical need and market landscape?

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Project management terms, translated

Aims = the broad goals of an entire research program

Goals = more focused, frames a single project

Milestone = decision point for next steps

Deliverable = a quantifiable achievement

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Milestones will have *tangible deliverables* for stakeholders to review

Milestone identification occurs in early planning stages.

- connected to decisions
- continue, adjust, or stop projects.

1. Define successful completion of the milestone.
2. Agree on the evidence and how it will be collected.
3. Be prepared to explain *how you know, and how you will show* the milestone has been reached.

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Deliverables are outputs from activities completed to reach a milestone

A road-trip with undefined duration or destination, still has stops for food, gas, water, a place to rest.

Even in earlier stage hypothesis-driven discovery research, you should still define specific milestones to be pursued.

Extremely important for collaborative projects

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SMART Objectives

- **S**pecific
- **M**easurable
- **A**ligned
- **R**ealistic
- **T**ime-bound

Example of a project objective:
Complete biocompatibility testing

Example of the project objective, made SMART:
Complete the chronic toxicity study needed for the regulatory filing in 6 months

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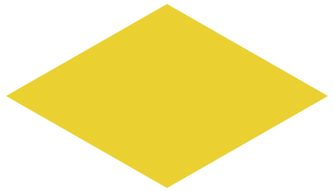
Building Flowcharts for Project Planning

Project start and end points



Milestones:
Major markers of progress and serve as project pivot points, tied to important project deliverables.

Deliverables
What you need to start a new activity, or what you produce that feeds into a next step. (Nouns)

Processes
Your project verbs. Action-oriented objectives being completed as a small step toward a milestone.

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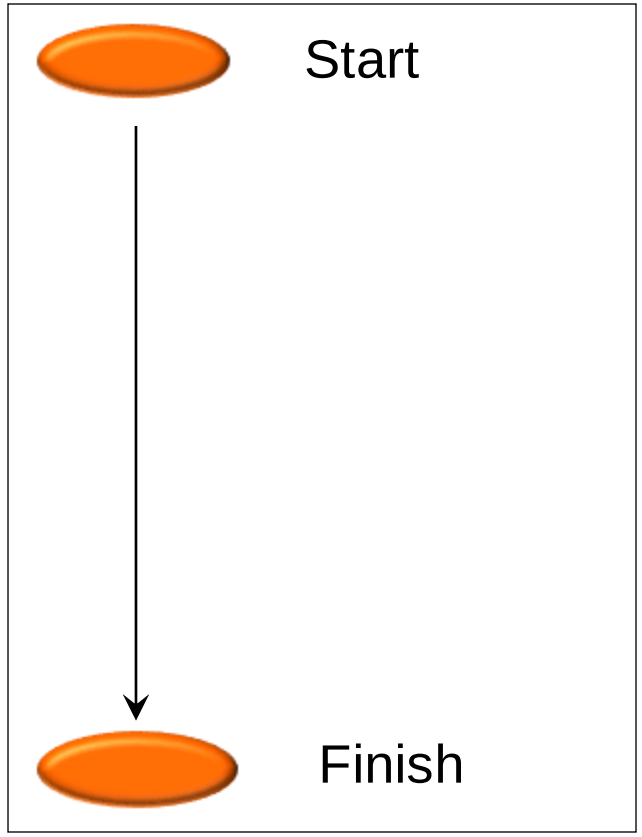
Guided project planning exercise

What is the project goal?

What is the scope of the work (time, budget, personnel)?



Write one item per post-it note

Use different color notes for project milestones, deliverables, work to produce each deliverable (processes)

Additional into on each note:
How much time to complete processes?
What resources are needed to complete deliverables?

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Estimating task time tips

- Type of task
  - Fixed unit task: Number of people on task will be limited
  - Fixed work task: People can be added to reduce duration of task
  - Fixed duration task: More people could be added, task duration remains the same
- Multiple perspectives
  - How long do different team members believe the task will take?
- “Two week rule”
- Consider dependencies and sequencing

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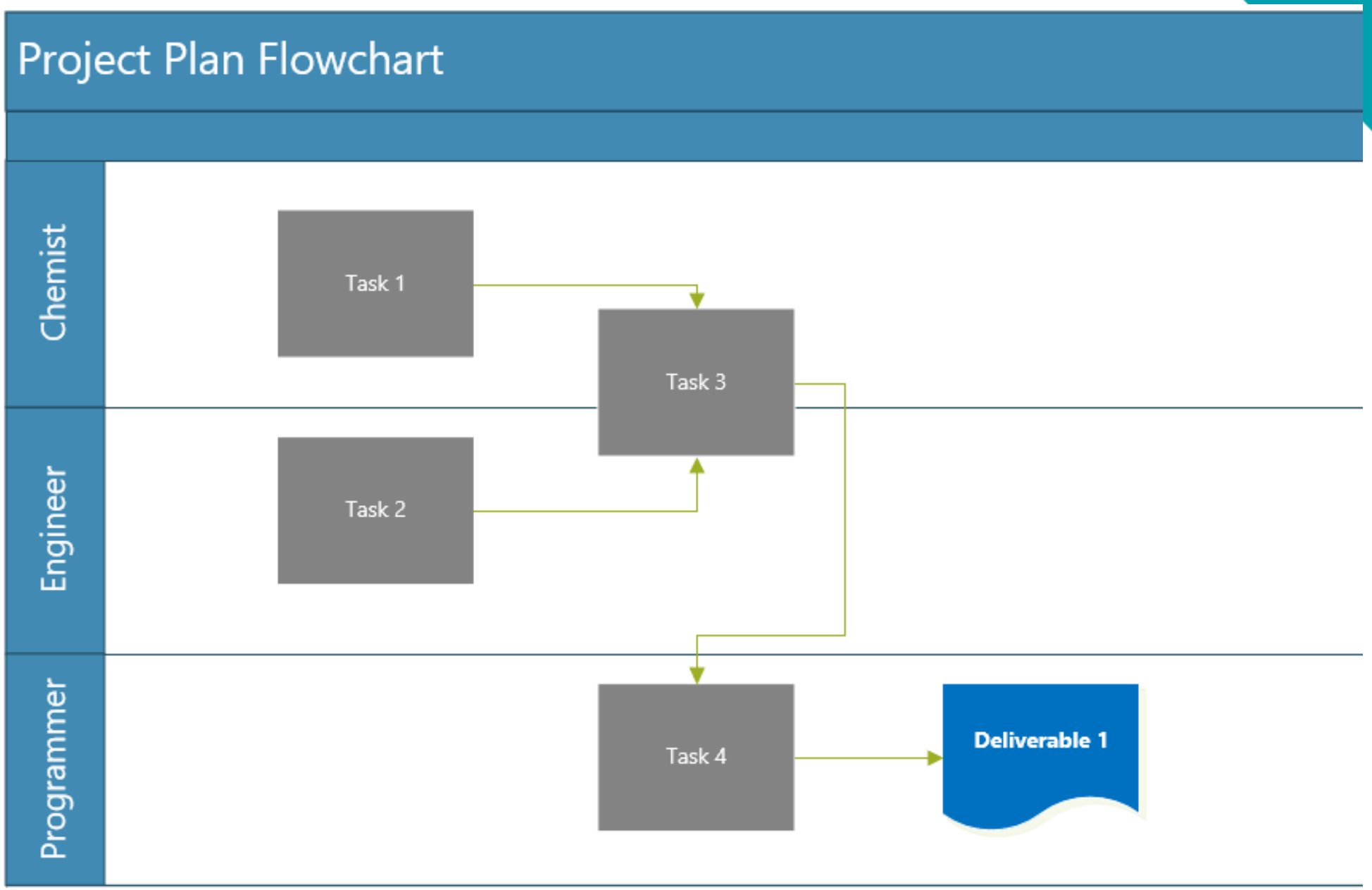
Project Plan Flowchart



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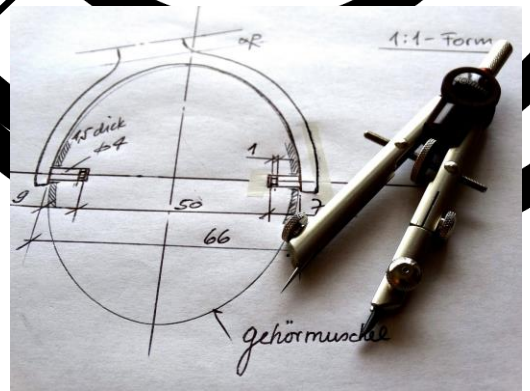
Product development is a highly iterative process.

Prototyping
and data collection

User feedback

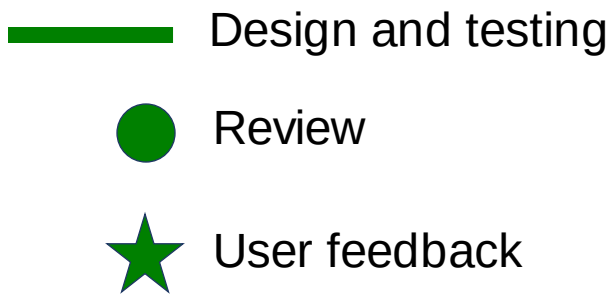
Design



There are multiple strategies for managing design and development projects

Waterfall

- Dependencies across technology types
- Single product launch at the end
- Outlined in Design Control Guidance



Agile (Scrum)

- Adaptive planning
- Frequent, focused reviews

Lean

- Solves largest problems first
- Iterative user feedback

Which project management method is best?

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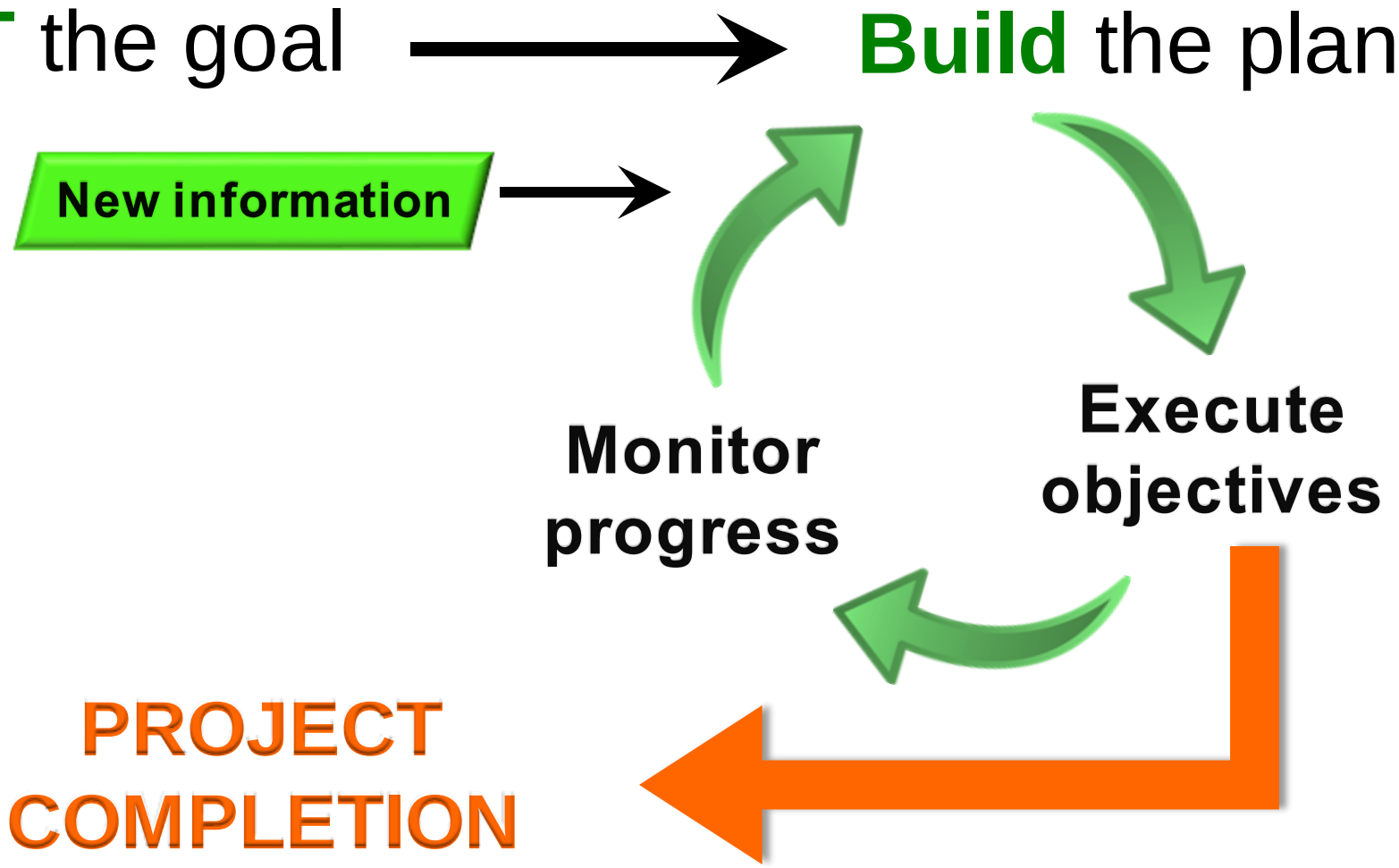
Your project plan is a **living document** to which you will make adjustments



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What types of *unforeseen* events occur during technology development projects?

Loss of access to resources

Unexpected results

Equipment failures

Staff changes

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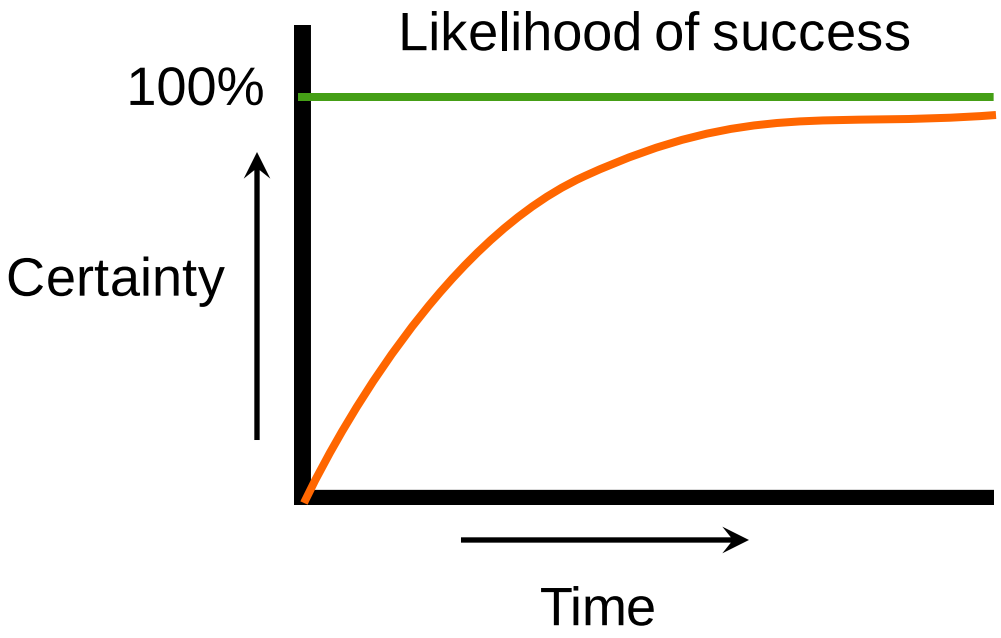
Key Project Management Take-Aways



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Project management resources

Software for decision trees and flowcharts:

- Lucidchart
- Microsoft Visio
- Google Drawings

Project planning software platforms:

- Include embedded templates/tools e.g. Gantt Charts, Team Task Management
- Free options: Airtable, Asana, Trello, Freedcamp
- Other options: Smartsheet, Microsoft Project/Planner/Teams

Project Management Institute (PMI.org)

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Questions?

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