

Project Time Management

مقرر: إداره وقت المشروع

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PMG 212

Lecture 07



Agenda

Productivity

- Introduction to Productivity in Construction
- Understanding Productivity vs. Production
- Measuring Productivity (Production Model Example)
- Productivity Index (PI)
- Controllable Factors Affecting Productivity
- Uncontrollable Factors Affecting Productivity
- The Results of Uncontrolled Obstacles
- Project Management: 1985–2009
- Lifecycle Phase for Project Management Maturity
- Project Vs Product
- Maturity and Excellence
- Success Factors
- The Many Faces of Failure

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Introduction to Productivity in Construction

- Labor is the primary driver of construction project performance.
- Productivity directly influences CPI (Cost Performance Index) and SPI (Schedule Performance Index).
- Productivity measures efficiency — output per unit of input.
- In construction, productivity typically varies over time.
- Effective labor management determines project success or failure.

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Understanding Productivity vs. Production

- **Production** = Total units of work completed.
- **Productivity** = Rate of production (units per labor-hour).
- A project can meet production targets but fail productivity targets.
- Example: 100 ft installed using double the planned labor = lower productivity.
- Productivity impacts earned value and contractor profitability.

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Measuring Productivity (Production Model Example)

- Daily Output Example: 100 LF per 8-hour workday.
- Crew Example: 2 workers $\times$ 8 hours = 16 labor-hours.
- Productivity = $100 \text{ LF} \div 16 \text{ labor-hours}$.
- Result = 6.25 LF per labor-hour.
- Productivity models help quantify efficiency mathematically.

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Productivity Index (PI)

- PI compares planned vs. actual performance.
- Formula: $PI = \text{Budgeted Work Hours (BWH)} \div \text{Actual Work Hours (AWH)}$.
- $PI > 1 \rightarrow$ Better than planned performance.
- $PI < 1 \rightarrow$ Underperformance.
- Most accurate when applied at labor cost element level.

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Controllable Factors Affecting Productivity

- Proper planning and task analysis.
- Availability of materials, tools, and equipment.
- Clear communication and effective supervision.
- Adequate training and appropriate crew size.
- Safe and well-organized work environment.

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Uncontrollable Factors Affecting Productivity

- Weather conditions and environmental factors.
- Worker health and personal issues.
- Economic conditions and regional factors.
- Strikes or work stoppages.
- Owner/client scope changes.

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The Results of Uncontrolled Obstacles

- New products introduced into the marketplace too late
- Temptation **اغراء** to make hasty **متعجل** decisions that prove to be costly.
- Management insisting on earlier and greater return on investment
- Greater difficulty in establishing on-target objectives in real time
- Problems in relating cost to technical performance and scheduling during the execution of the project

The Results of Uncontrolled Obstacles

- Decreased profits
- Increased manpower needs
- Cost overruns, schedule delays, and penalty payments occurring earlier and earlier
- An inability to cope with new technology
- R&D results too late to benefit existing product lines

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Project Management: 1985–2009

- About markets, production methods, costs and scientific potentials are related to investment decisions.
- All of these factors have combined to produce a king-size managerial headache.
- There are just too many crucial decisions to have them all processed and resolved through regular line hierarchy at the top of the organization.

Project Management: 1985–2009

Providing the project manager with integrative responsibility resulted in:

- Total accountability assumed by a single person
- Project rather than functional dedication
- A requirement for coordination across functional interfaces
- Proper utilization of integrated planning and control

Project Management: 1985–2009

By the 1990s, companies had begun to realize that implementing project management was a necessity, not a choice.

The question was not how to implement project management, but how fast could it be done?

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Lifecycle Phase for Project Management Maturity

Embryonic Phase	Executive Management Acceptance Phase	Line Management Acceptance Phase	Growth Phase	Maturity Phase
- Recognize need - Recognize benefits - Recognize applications - Recognize what must be done	- Visible executive support - Executive understanding of project management - Project sponsorship - Willingness to change way of doing business	- Line management support - Line management commitment - Line management education - Willingness to release employees for project management training	- Use of life-cycle phases - Development of a project management methodology - Commitment to planning - Minimization of “creeping scope” - Selection of a project tracking system	- Development of a management cost/schedule control system - Integrating cost and schedule control - Developing an educational program to enhance project management skills

Lifecycle Phase for Project Management Maturity

1- Embryonic Phase

Recognize need → Awareness that projects require structured management.

Recognize benefits → Understanding how project management improves efficiency, reduces risk, and saves cost.

Recognize applications → Identifying where project management can be applied (construction, IT, R&D).

Recognize what must be done → Initial steps: appoint a project leader, define scope, and plan resources.

Lifecycle Phase for Project Management Maturity

2- Executive Management Acceptance Phase

Visible executive support → Leadership must actively endorse project management.

Understanding project management → Executives realize it is not just paperwork, but a strategic tool.

Project sponsorship → Senior managers allocate funding and resources.

Willingness to change business practices → Acceptance that traditional approaches may need updating.

Lifecycle Phase for Project Management Maturity

3- Line Management Acceptance Phase

Line management support → Department heads align with project goals.

Commitment from line managers → They assign staff and encourage collaboration.

Line management education → Training managers in project principles and methodologies.

Willingness to release employees for training → Investing in building PM capabilities within the team.

Lifecycle Phase for Project Management Maturity

4- Growth Phase

Use of life-cycle phases → Projects progress through defined stages (initiation → planning → execution → closure).

Development of methodology → Adoption of formal frameworks (PMBOK, PRINCE2).

Commitment to planning → Emphasis on detailed schedules, budgets, and risk management.

Minimization of “scope creep” → Keeping projects focused on agreed objectives.

Project tracking system → Using software/tools for monitoring progress.

Lifecycle Phase for Project Management Maturity

5- Maturity Phase

Cost/schedule control system → Implementing earned value management (EVM) and dashboards.

Integrating cost and schedule → Coordinating budgets with timelines for realistic forecasts.

Educational programs → Continuous training and certification (PMP, PgMP, Agile).

Outcome → Sustainable project success and an organizational culture of excellence.

The Six Driving Forces that lead recognize the need for Project Management

- Capital projects
- Customer expectations
- Competitiveness
- Executive understanding
- New project development
- Efficiency and effectiveness

The components of survival

Efficiency and
Effectiveness

Capital
Projects

New Product
Development

Customers'
Expectations

Executive
Understanding

Competitiveness

SURVIVAL

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graph TD; A[Efficiency and Effectiveness] --> F((SURVIVAL)); B[Capital Projects] --> F; C[Customers' Expectations] --> F; D[Competitiveness] --> F; E[Executive Understanding] --> F; G[New Product Development] --> F;
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Project Vs Product

Introduction to Scope:

Scope defines the boundaries of what will (and won't) be done.

Divided into **Project Scope** and **Product Scope**.

Helps avoid misunderstandings and scope creep.

Project Vs Product

Project Scope – Definition

Describes the **work required** to deliver the final outcome.

Includes all activities, tasks, and deliverables.

Example: *“Developing a mobile banking app” → coding, testing, training, deployment.*

Project Vs Product

Product Scope – Definition

Describes the **features and characteristics** of the deliverable itself.

Focuses on *“what the end product will do.”*

Example: *“Mobile banking app” → fund transfers, bill payments, biometric login, notifications.*

Project Vs Product

Project Scope vs Product Scope (Comparison)

Aspect	Project Scope	Product Scope
Focus	Work to be done	Features of deliverable
Example (Car Project)	Designing, testing, assembly	Fuel efficiency, safety features, GPS
Managed By	Project Manager	Product Owner / Customer

Project Vs Product

Project Scope – Key Elements

Scope statement → formal description of work.

WBS (Work Breakdown Structure) → breaking down work into manageable parts.

Deliverables list → clear outputs at each stage.

Exclusions → what is NOT part of the project.

Project Vs Product

Product Scope – Key Elements

Functional requirements → what the product must do.

Non-functional requirements → performance, quality, security.

Acceptance criteria → conditions for customer sign-off.

User experience (UX) considerations.

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Maturity and Excellence

Introduction to Maturity in Project Management

Maturity = structured processes, methods, and standards.

Goal → Predictable outcomes & repeatable success.

Not just experience, but **systematic improvement**.

Maturity and Excellence

Characteristics of Mature Organizations

Standardized methodology across projects.

Consistent use of tools (MS Project, Jira, Primavera).

Trained workforce with certifications.

Effective governance and risk management.

Maturity and Excellence

Excellence in Project Management

Continuous stream of successful projects.

Success measured not only in time & cost, but also in **customer value**.

Creating an **environment for success** (culture, leadership, tools).

Maturity and Excellence

Key Factors Driving Excellence

Leadership commitment.

Integration of projects with strategy.

Investment in people (training, certifications).

Knowledge sharing across projects.

Maturity and Excellence

Path to Excellence

Assess current maturity level.

Develop a roadmap for improvement.

Establish a **PMO (Project Management Office)**.

Promote a **continuous learning culture**.

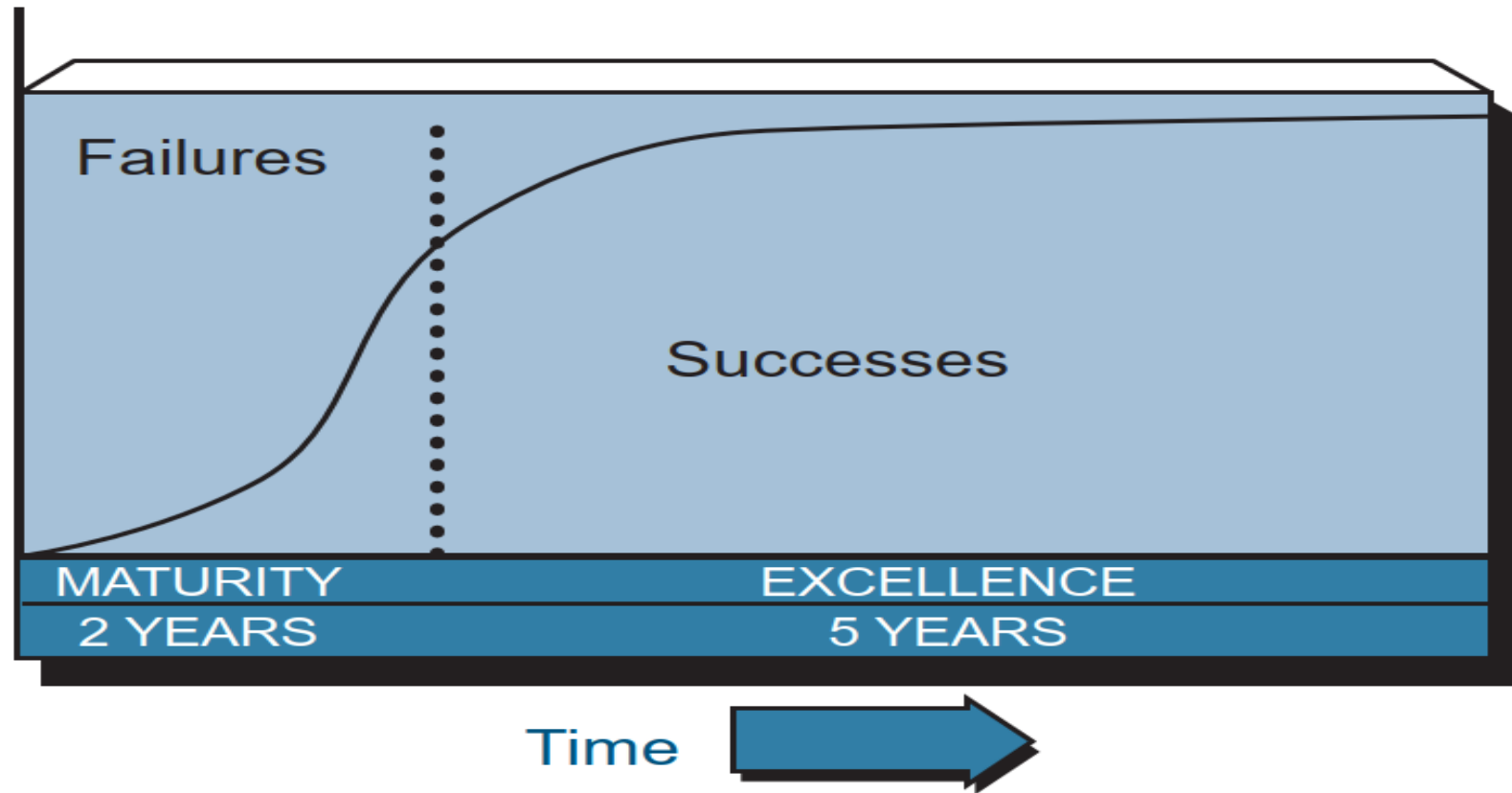
Align success with **company + customer objectives**.

Maturity and Excellence

- Maturity in project management is the implementation of a standard methodology and accompanying processes such that there exists a high likelihood of repeated successes.
- Organizations excellent in project management are those that create the environment in which there exists a continuous stream of successfully managed projects and where success is measured by what is in the best interest of both the company and the project (i.e.,customer).

The Growth of Excellence.

↑
Projects



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Primary Success Factors

- Within time
- Within cost
- Within quality limits
- Accepted by the customer

Secondary Success Factors

- Follow-on work from this customer
- Using the customer's name as a reference on your literature
- Commercialization تسويق of a product
- With minimum or mutually agreed upon scope changes
- Without disturbing the main flow of work

Secondary Success Factors

- Maintaining ethical conduct
- Providing a strategic alignment
- Maintaining a corporate reputation
- Maintaining regulatory agency relations

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The Many Faces of Failure

- Ineffective planning
- Ineffective scheduling
- Ineffective estimating
- Ineffective cost control
- Project objectives being “moving targets”

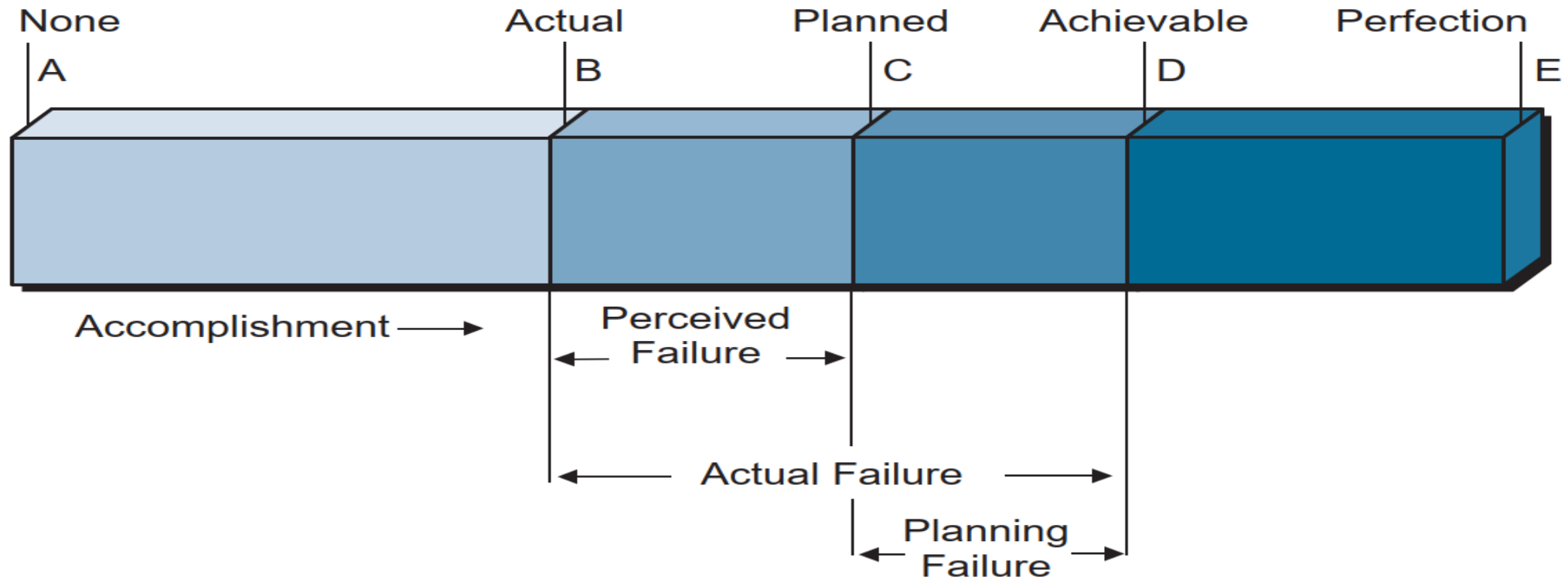
Components of Failure (pessimistic planning).

Project management has planned a level of accomplishment (C) lower than what is achievable given project circumstances and resources (D).

This is a classic under planning situation.

Actual accomplishment (B), however, was less than planned.

Components of Failure (pessimistic planning).



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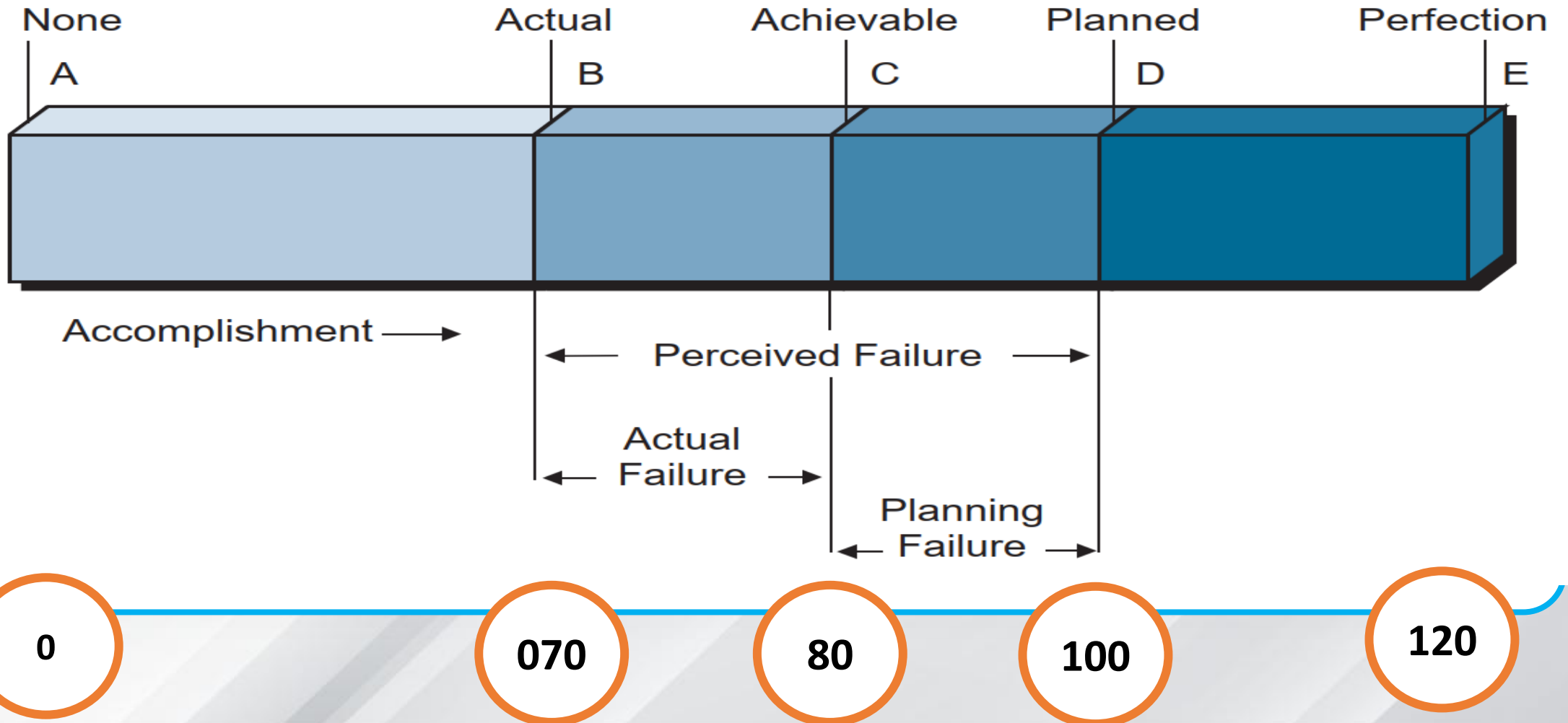
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Components of failure (optimistic planning).

Here, we have planned to accomplish more than is achievable. Planning failure is again assured even if no actual failure occurs. In both of these situations (overplanning and under planning), the actual failure is the same, but the perceived failure can vary considerably.

Components of failure (optimistic planning).



The Many Faces of Failure

Today, most project management practitioners focus on the planning failure term.

If this term can be compressed or even eliminated, then the magnitude of the actual failure, should it occur, would be diminished. A good project management methodology helps to reduce this term.

We now believe that the existence of this term is largely due to the project manager's inability to perform effective risk management.



Thank You