CSSE 372 Software Project Management:
Anatomy of a Software Project Plan

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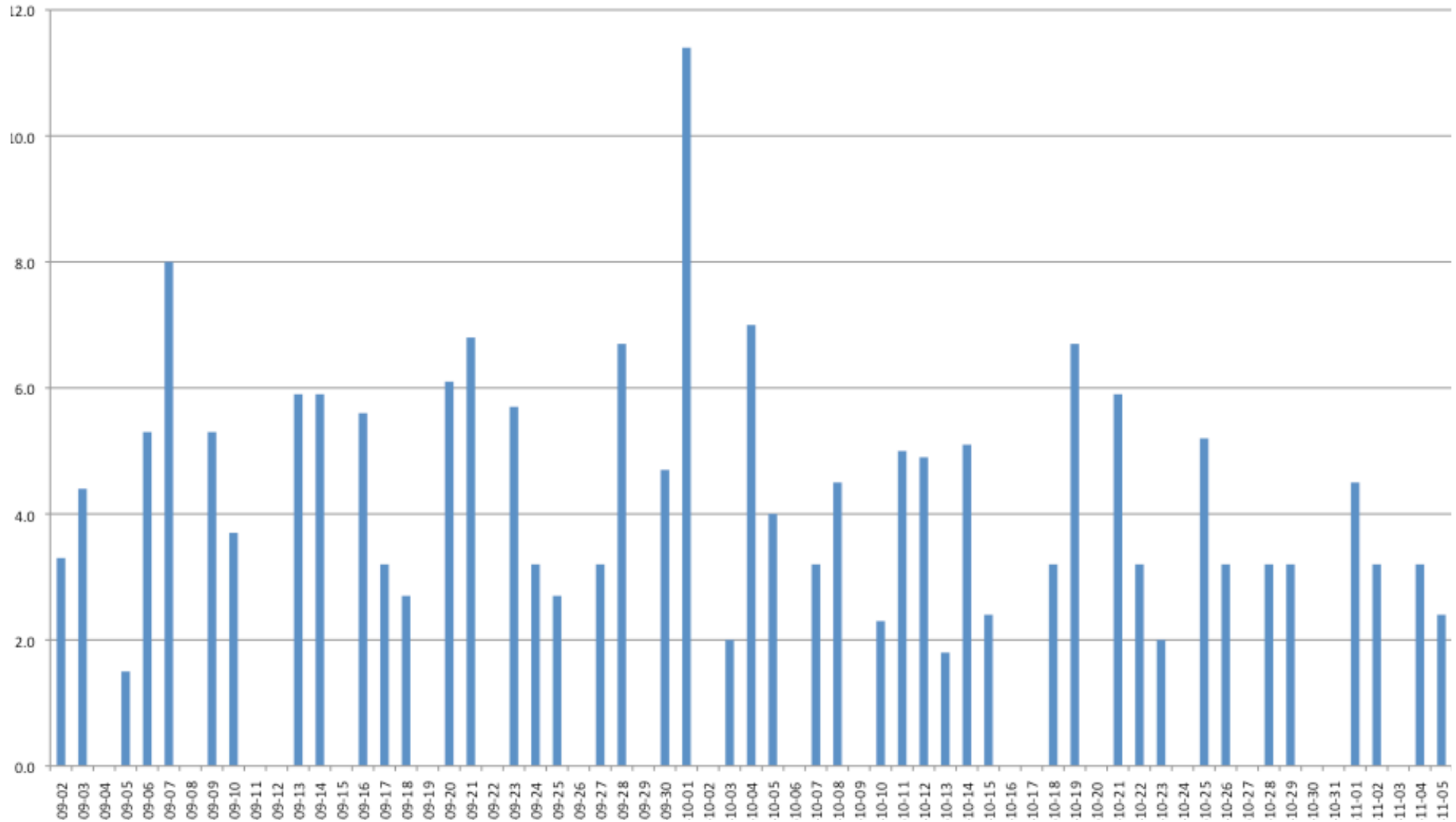
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Vague Plans are hard to follow...

In lieu of mapping software, the real programmer wrote a Perl program which, given a USB GPS receiver and a destination, printed 'LEFT' 'RIGHT' OR 'STRAIGHT' based on the heading.

Homework 2 – Task Schedules

Learning Outcomes: Plan (verb)

Create a plan for an intermediate size software project & manage to the plan as project evolves.

- Outline major parts of Software Project Plan

- Describe how plan is about people, process, product, and project

- Examine the SW Planning Process

Statement of Work (SOW)

A detailed description of all of the work products which will be produced over the course of the project. It includes:

- **List of features that will be developed**

- **Description of each intermediate deliverable or work product**

- **Estimated effort involved for each work product to be delivered (optional)**

Get to the Essence of a Project

- **<u>Why</u>** is the system being developed?

- **<u>What</u>** will be done? By **<u>when</u>**?

- **<u>Who</u>** is responsible for a function or component?

- **<u>Where</u>** are they organizationally located?

- **<u>How</u>** will the job be done technically and managerially?

- **<u>How much</u>** of each resource (e.g., people, software, tools, database) will be needed?

What are the major elements of a software project plan?

- Think for 15.3 seconds…
- Turn to a neighbor and discuss it for a minute
- Then let's share your ideas…

The 4 P's of a Software Project

- **People**

- **Product**

- **Process**

- **Project**

Software Project Planning

The goal of software project planning is to establish a pragmatic strategy for controlling, tracking, and monitoring the complexities of a technical project.

Why?

So the end result gets done on time, on budget, with the requisite functional quality!
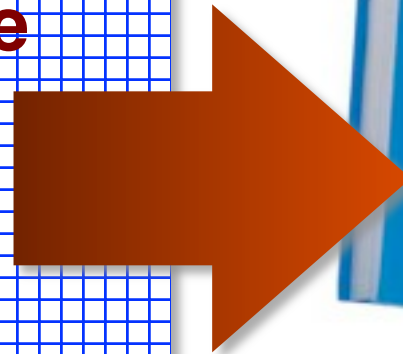
To deliver value to the customer!

Basic Software Planning Steps

- **Scoping**

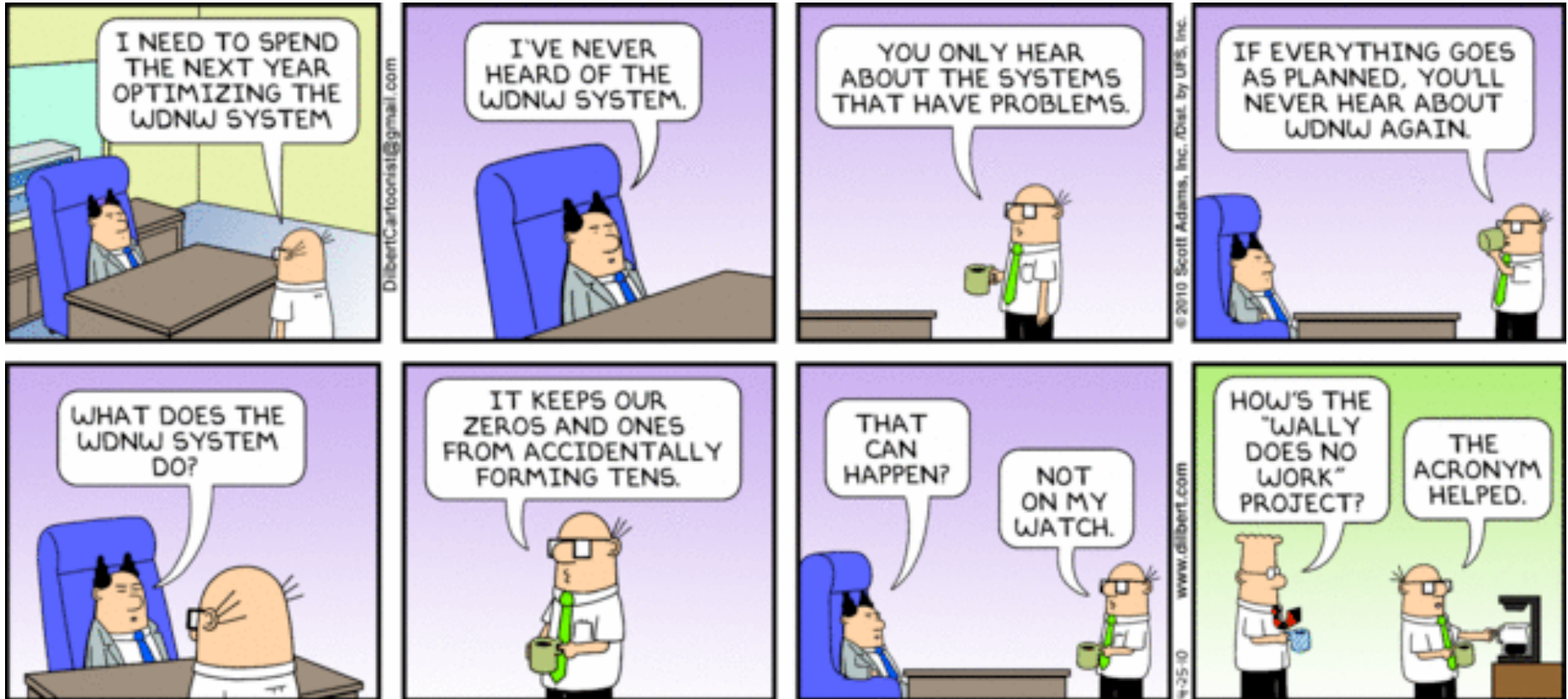- **Estimation**

- **Risk**

- **Schedule**

- **Control strategy**

Write it Down!

Project Scope
Estimates
Risks
Schedule
Control strategy

Software Project Plan

The plan only records the planning… the planning is the important part!

There's planning then there is a plan...

Example: Basic Software Project Plan

1.0 GOALS AND OBJECTIVES

1.1 Statement of Scope

1.1.1 General Requirements

1.1.2 Extended Enhancement

1.2 System Context

1.3 Major Constraints

2.0 PROJECT ESTIMATES

2.1 Estimation Techniques and Results

2.1.1 Process-Based Estimation

2.1.2 LOC-Based Estimation with Parametric Model

2.1.3 Historical Data Used for Estimates

2.4 Project Resources

2.4.1 Staffing

2.4.2 Minimal Hardware Requirements

2.4.3 Minimal Software Requirements

Basic Software Project Plan (continued)

3.0 RISK MANAGEMENT

3.1 Scope and Intent of Risk Management Activities

3.2 Risk Management Organizational Role

3.3 Project Risk Table and Sheets (Probability and Impact)

3.4 Contingency Approach

4.0 PROJECT SCHEDULE

4.1 Work Breakdown Structure

4.2 Deliverables and Milestones (Timeline Chart)

5.0 PROJECT TEAM ORGANIZATION

5.1 Team Structure

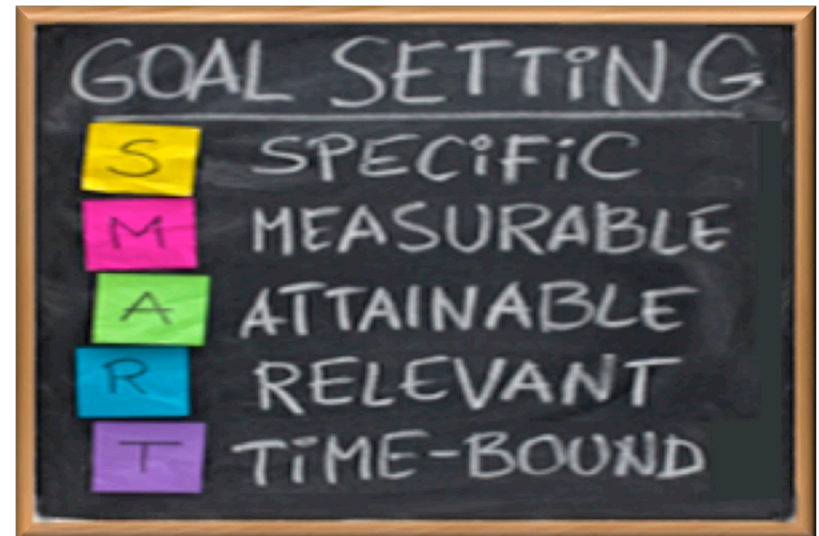### 5.2 Member Roles and Responsibilities

6.0 TRACKING AND CONTROL MECHANISMS

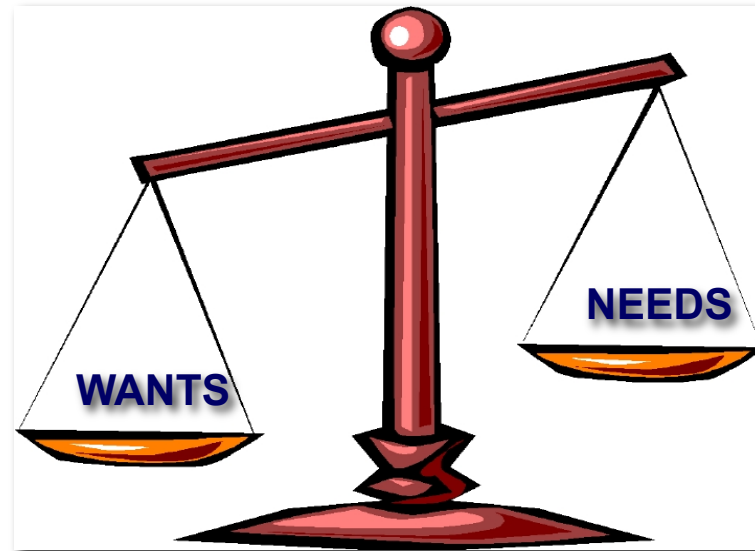### 6.1 Quality Assurance Mechanisms

6.2 Change Management and Control

Get the Goals Right

- **Project teams hit targets you set**

- **Too many goals ➔ no goals**

- **A good vision describes the target as well as *what to leave out!***

The Client Wants / Needs Dilemma

What your client wants may not be what they need.

How can you ensure that what your clients "__wants__" are what they __need__?

Who is Our Client?

Good Client

- **Know what they want**
- **Know what it takes to deliver**
- **Work towards best solution**
- **Easy to work with**
- **Meaningfully involved**

Not So Good Client

- **Not sure of what they want**
- **Constantly change their mind**
- **Not interested in solving project problems**
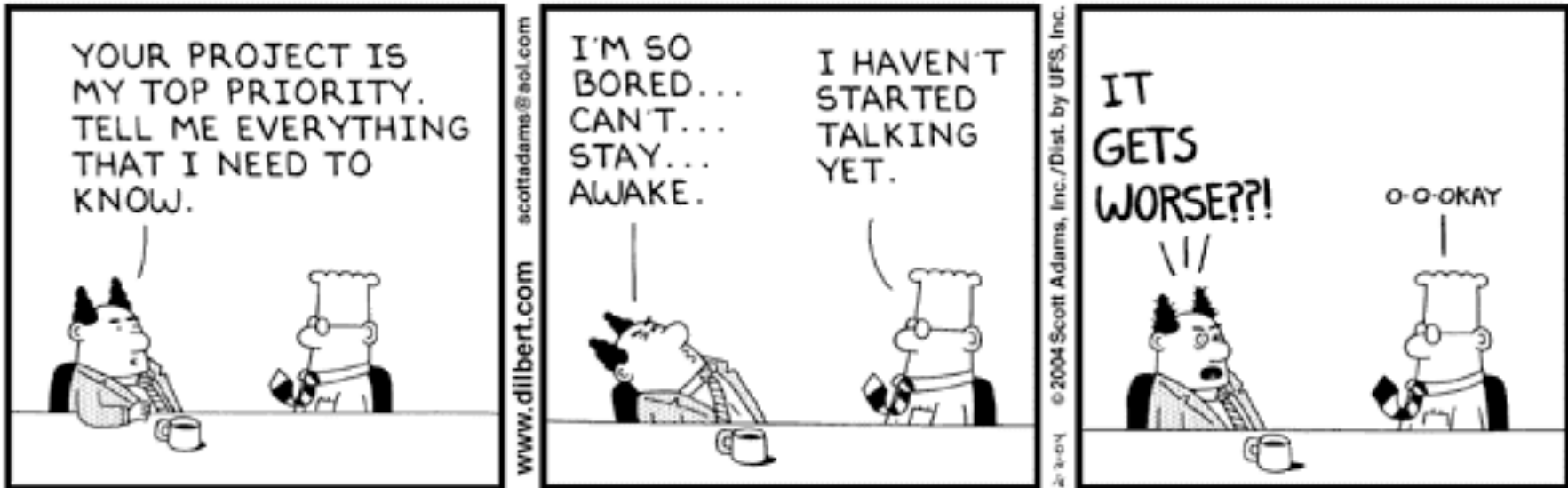- **Hard to satisfy**
- **Not very involved**

Project manager & team must satisfy the needs of <u>both</u>.
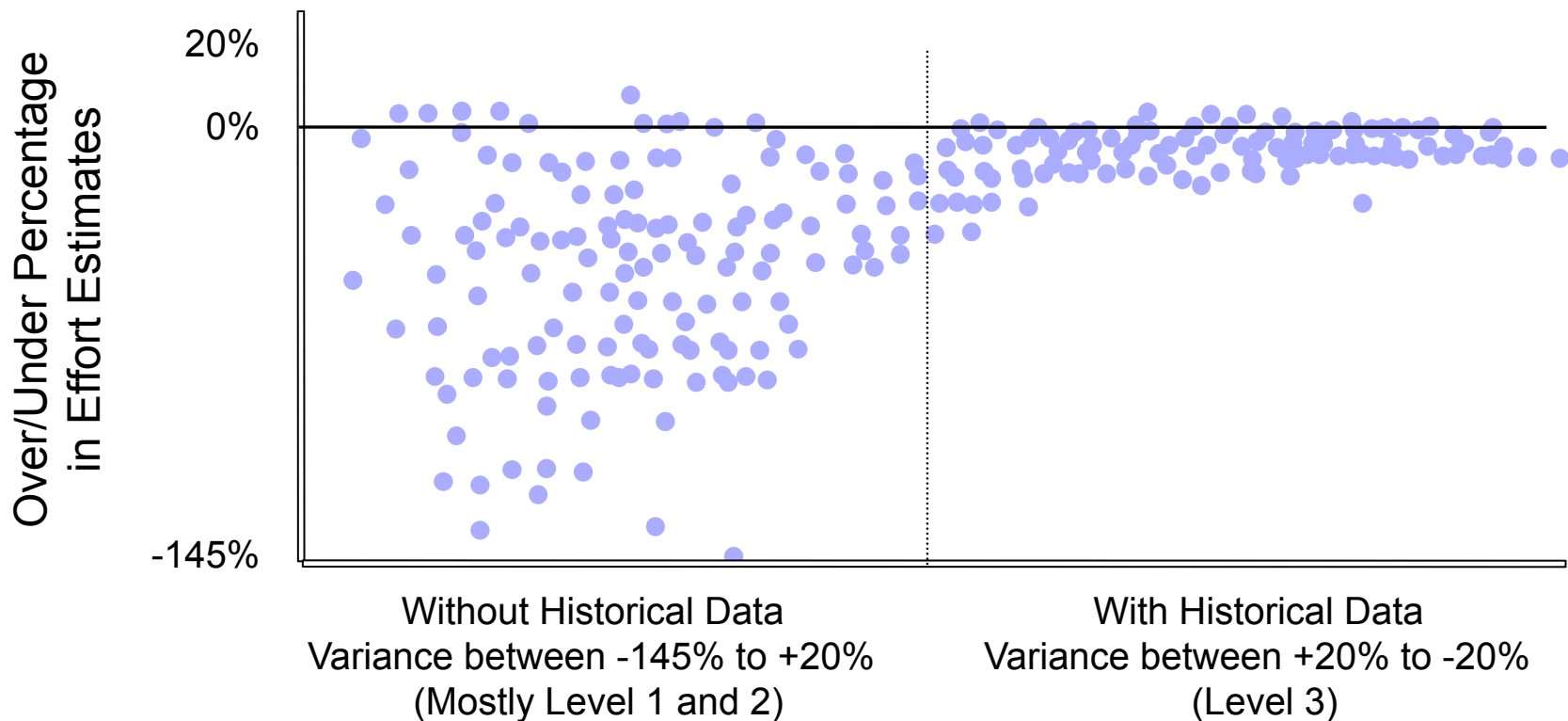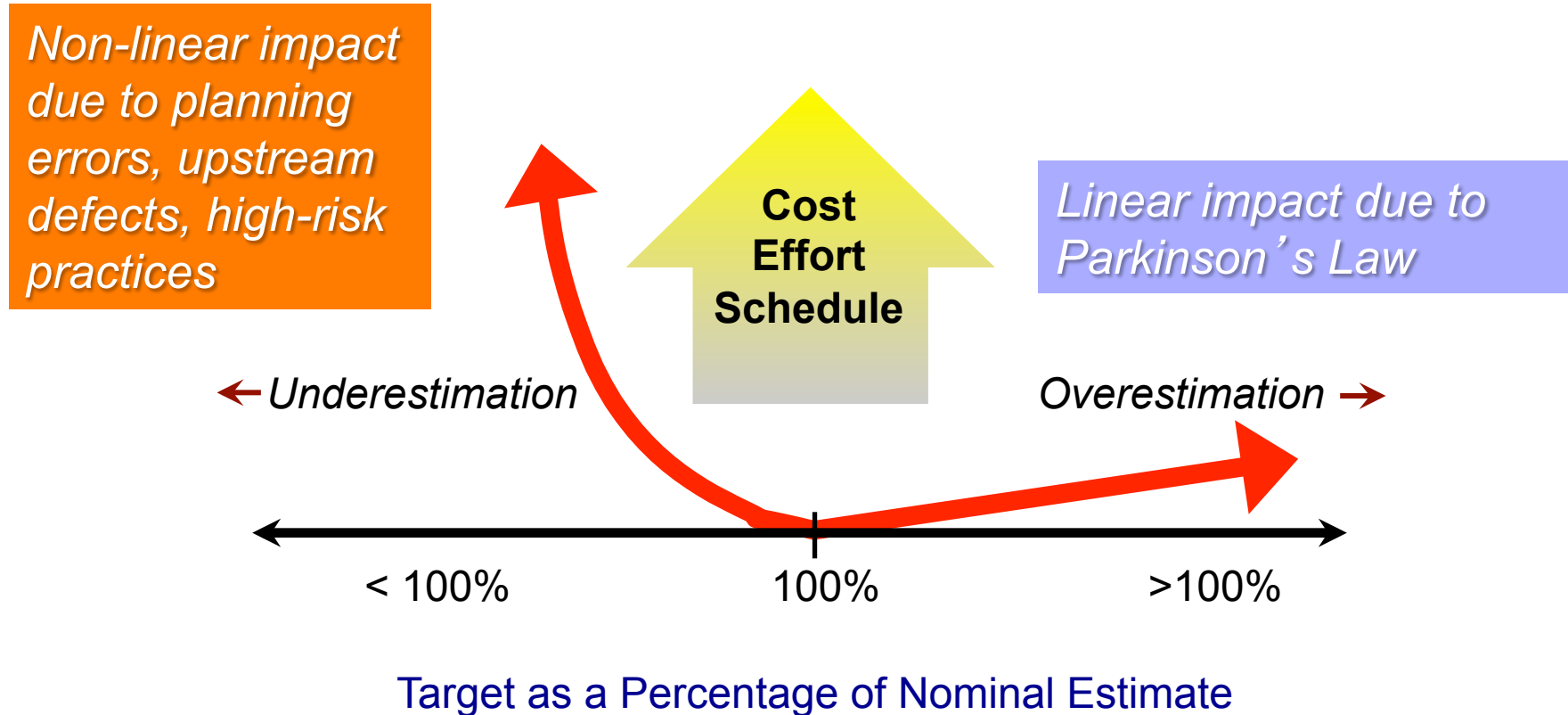
Sometimes Management doesn't get it...

Typical Pattern of Estimation Accuracy and Improved Estimation

Over/Under Percentage in Effort Estimates

20%

0%

-145%

Without Historical Data
Variance between -145% to +20%
(Mostly Level 1 and 2)

With Historical Data
Variance between +20% to -20%
(Level 3)

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Effect of Estimation Accuracy

Non-linear impact due to planning errors, upstream defects, high-risk practices

Cost Effort Schedule

Linear impact due to Parkinson's Law

← *Underestimation*

Overestimation →

< 100%　　　　100%　　　　>100%

Target as a Percentage of Nominal Estimate
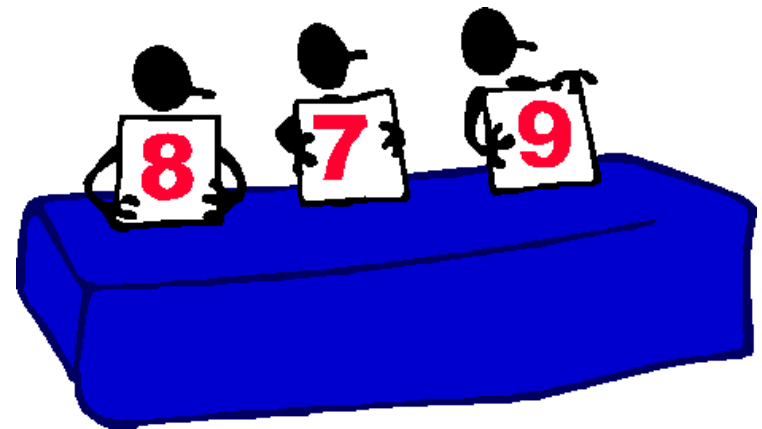
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The Pain Curve
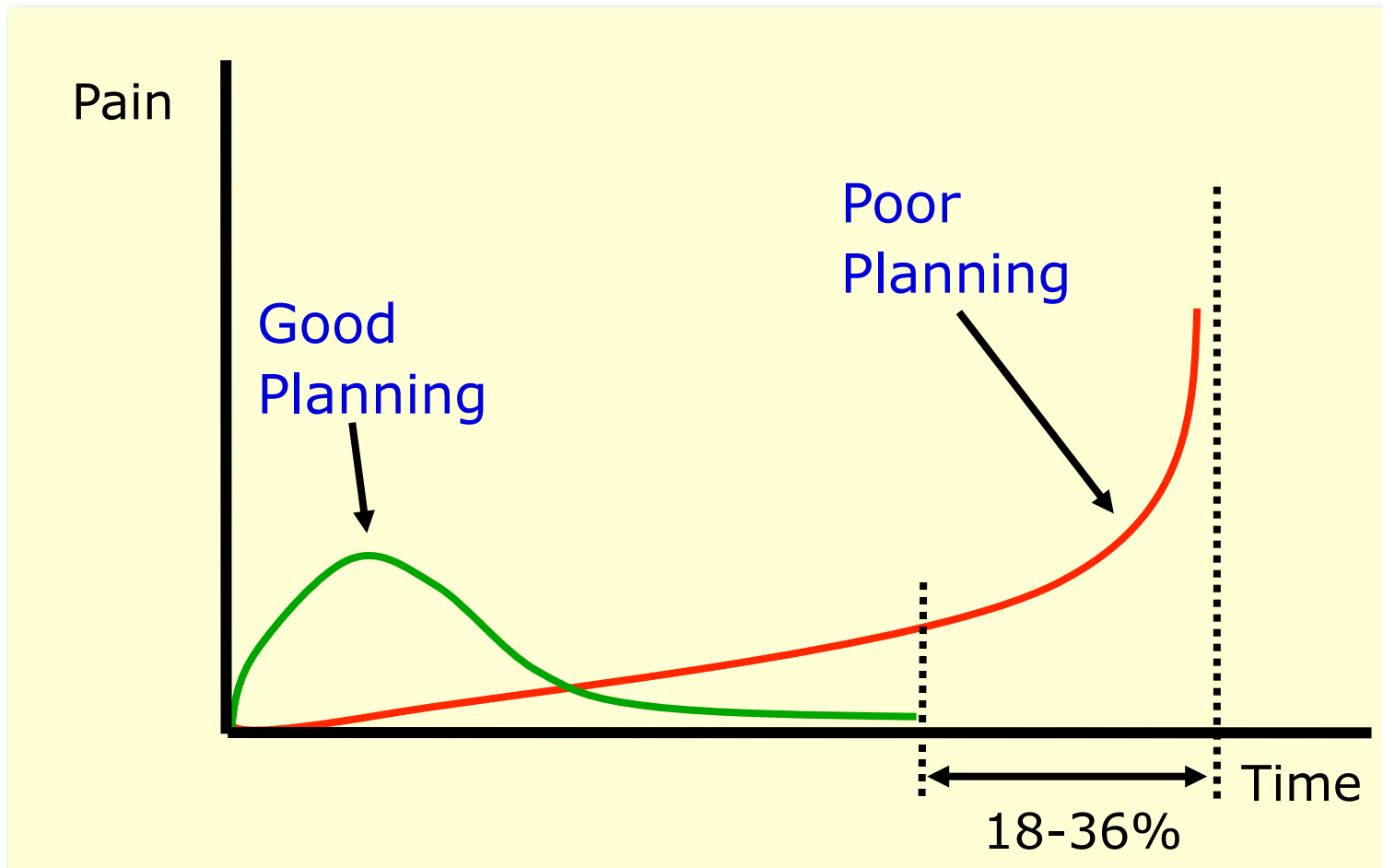
The great thing about not planning is that failure comes as a complete and utter surprise!

Importance of Planning

- **Planning Reduces Uncertainty**

- **Planning Increases Understanding**
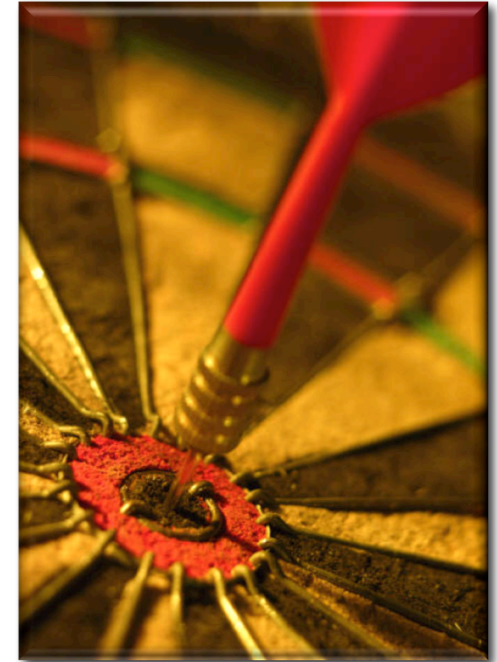
- **Planning Improves Efficiency**

Software Project Planning Packages

Yes

- Very large projects
- Distributed teams
- Extensive use of vendors and contractors

No

- Small projects
- Short duration project increments
- Adds too much non-value-added work

How to Run a Project Planning Session

- **Planning team clarifies Business Case**

- **Planning team creates the complete WBS**

- **Estimate task duration and resource needs**

- **Construct project network diagram**

- **Determine critical path**

- **Revise and approve project completion date**

- **Finalize resource schedule**

- **Gain consensus on the project plan**

Homework and Reading Reminders

- Read "Process Models in Software Engineering" by Walt Scacchi

- Get head start on Homework 2

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