REQUIREMENT ENGINEERING INTRODUCTION

REQUIREMENT ENGINEERING

ENGREQ

2023/24

Course Outcomes & Evaluation

Course Outcomes

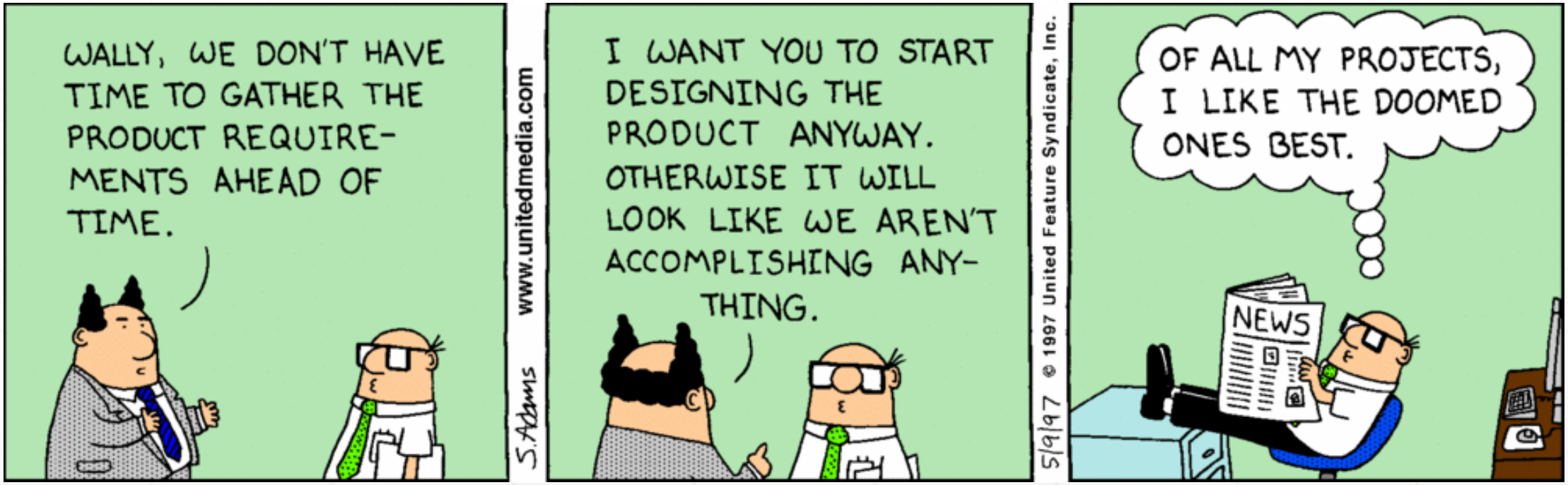
- Conduct a process of software requirement elicitation
- Specify and analyse the requirements for a software solution
- Validate and negotiate requirements
- Manage the requirements life cycle
- Design, implement and document a software prototype that addresses the engineered requirements
- Working in teams, plan and manage the project, communicate and document their activity

Evaluation

- Project 70% of final grade
  - Minimum grade (average): 8
  - 3 iterations
    - P1: 25% (SRS)
    - P2: 20% software prototype + revised doc
    - P3: 25% software prototype + revised doc
- Exam 30% of final grade
  - Minimum grade: 10

Motivation

The Importance



"Only **29%** of the projects **succeed** in delivering the desired functionality, **on time** and **on budget**"

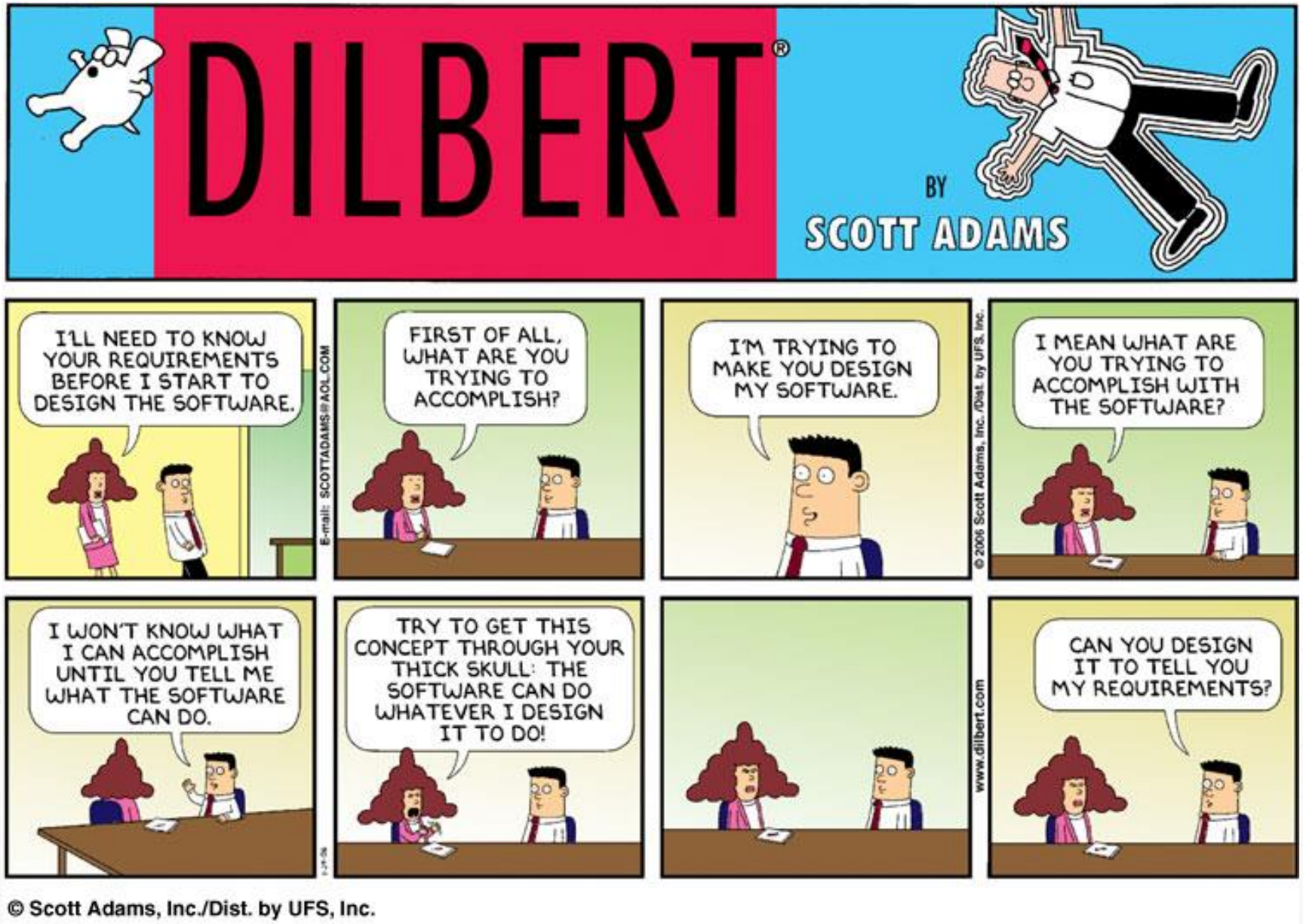
The Standish Group, 2015

“**47%**
of unsuccessful projects **fail** to meet goals due to **poor requirements management**”

Pulse of the Profession®, PMI, Agosto 2014

The problem

The problem


DILBERT®
BY
SCOTT ADAMS
I'LL NEED TO KNOW YOUR REQUIREMENTS BEFORE I START TO DESIGN THE SOFTWARE.
FIRST OF ALL, WHAT ARE YOU TRYING TO ACCOMPLISH?
I'M TRYING TO MAKE YOU DESIGN MY SOFTWARE.
I MEAN WHAT ARE YOU TRYING TO ACCOMPLISH WITH THE SOFTWARE?
I WON'T KNOW WHAT I CAN ACCOMPLISH UNTIL YOU TELL ME WHAT THE SOFTWARE CAN DO.
TRY TO GET THIS CONCEPT THROUGH YOUR THICK SKULL: THE SOFTWARE CAN DO WHATEVER I DESIGN IT TO DO!
CAN YOU DESIGN IT TO TELL YOU MY REQUIREMENTS?
E-mail: SCOTTADAMS@AOL.COM
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The problem

It’s your worst nightmare. A customer walks into your office, sits down, looks you straight in the eye, and says, “I know you think you understand what I said, but what you don’t understand is what I said is not what I meant.”

The problem

- Understanding the requirements of a problem is among the most difficult tasks that face a software engineer:
  - Doesn’t the customer know what is required?
  - Shouldn’t the end users have a good understanding of the features and functions that will provide benefit?
  - The needs will change throughout the project.

The problem (most common issues)

- **Tacit Knowledge**
  - “I forgot to mention that the system accepts requests automatically. I’m so used that I Forget to mention it…”
- **False AssumptionsFalsos Pressupostos**
  - “The system doesn’t build reports automatically?”
- **Knowledge for which no one is responsible**
  - “No one knows why the system works like this. A person who made these decisions left but should have documented"

The problem when…

the requirements seems clear to you…

https://www.youtube.com/watch?v=Ct-lOOUqmyY

Definitions

Introduction

Requirement

1. A condition or capability needed by a user to solve a problem or achieve an objective*
2. A condition or capability that must be met or possessed by a system or system component to satisfy a contract, standard, specification, or other formally imposed documents*
3. A documented representation of a condition or capability as in (1) or (2)*
4. Requisitos envolvem as necessidades e desejos do cliente: Quais as capacidades do sistema? Um requisito é o que deve acontecer, não como deve acontecer. Desta forma, os requisitos apresentam o âmbito da conceção e da implementação em vista**

*IEEE 610.12-1990: IEEE Standard Glossary of Software Engineering Terminology

** Cannegieter, H., & Arensen, M. (2008). Success met de Requirements! The Hague, Netherlands: Academic service

Requirements Engineering

- The broad spectrum of tasks and techniques that lead to an understanding of requirements is called **requirements engineering**.
- From a software process perspective, requirements engineering is a major software engineering action that begins during the communication activity and continues into the modeling activity. It must be adapted to the needs of the process, the project, the product, and the people doing the work.

Requirements Engineering

- “The hardest single part of building a software system is deciding what to build. No part of the work so cripples the resulting system if done wrong. No other part is more difficult to rectify later.” Fred Brooks

Requirements Engineering

- Requirements engineering provides the appropriate mechanism for understanding what the customer wants, analyzing need, assessing feasibility, negotiating a reasonable solution, specifying the solution unambiguously, validating the specification, and managing the requirements;
- It encompasses seven distinct tasks: inception, elicitation, elaboration, negotiation, specification, validation, and management.
- It is important to note that some of these tasks occur in parallel and all are adapted to the needs of the project.

Project vs Product Requirements

Project and Product - Approaches

Project

- Have a Begin and End date
- Short-term team
- Predictive Planning (up-front)
- **One-off delivery**
- **Project Requirements**
- **Investment delivers scope**

Product

- Permanent (until decommissioned)
- Long-lived team
- Adaptive planning (iterative)
- **Continual Improvement**
- **Evolving customer needs (requirements)**
- **Investment delivers benefits/KPIs**

Source: Software Requirements (Third Edition) by Joy Beatty & Karl Wiegers

Project and Product - Inputs

Project Input

- Customer request
- Stakeholder Request
- Sales Demand
- Development with external parties

Product Input

- Strategical positioning
- Market needs
- Competitive benchmark
- Continuous feedback and Improvement

Source: Software Requirements (Third Edition) by Joy Beatty & Karl Wiegers

Project and Product – Stakeholders

Project Stakeholders

- Specific Customer
- External providers/systems
- Company Sponsor
  - Sales
  - Executive team
  - Etc.

Product Input

- Multiple request from diferent customers
- Lack of functionality due to competition
- New markets (e.g. country)
- Continuous feedback from internal departments
  - UX, Delivery, Support, Customer Success Managers, etc.
- Innovation

Source: Software Requirements (Third Edition) by Joy Beatty & Karl Wiegers

Project and Product – Requirements

Project

- Specific request

Product

- Analyze landscape to meet the goal in the most eficient way
- Extra techniques needs to be applied in order to define the requirements properly

Source: Software Requirements (Third Edition) by Joy Beatty & Karl Wiegers