Software Processes

Prof. Dr. Dirk Riehle

Friedrich-Alexander University Erlangen-Nürnberg

AMOS C01

Key Functions in Software Engineering

1. Product Management
2. Engineering Management
3. Software Development
4. Quality Assurance

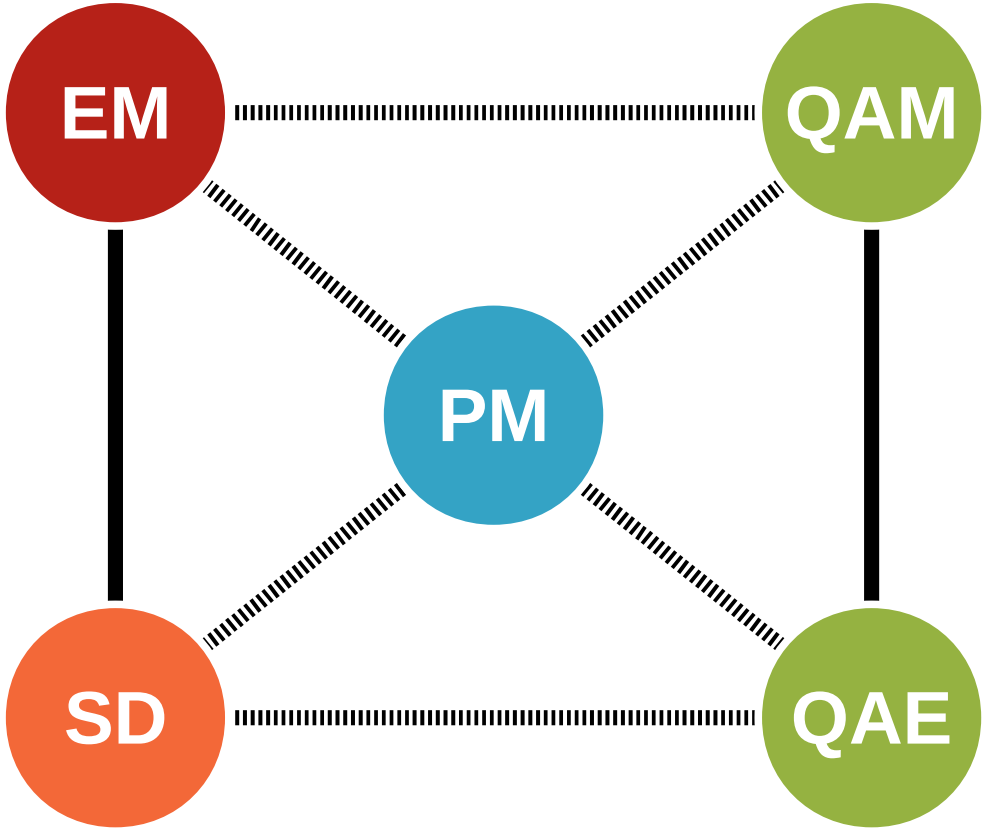
Describing Software Engineering Processes

Roles

Practices

Artifacts

Key Roles in Software Engineering



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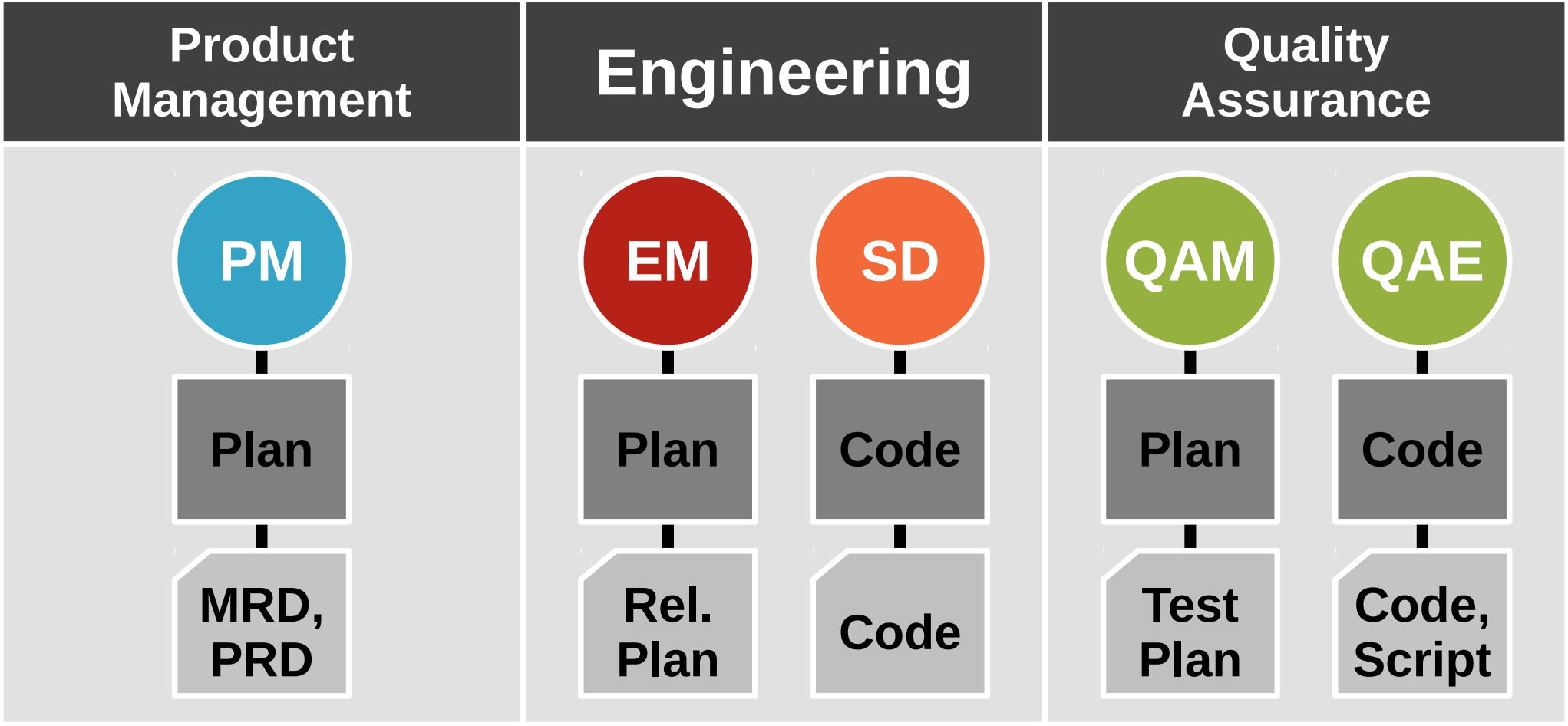
Key Practices and Artifacts



Product Management

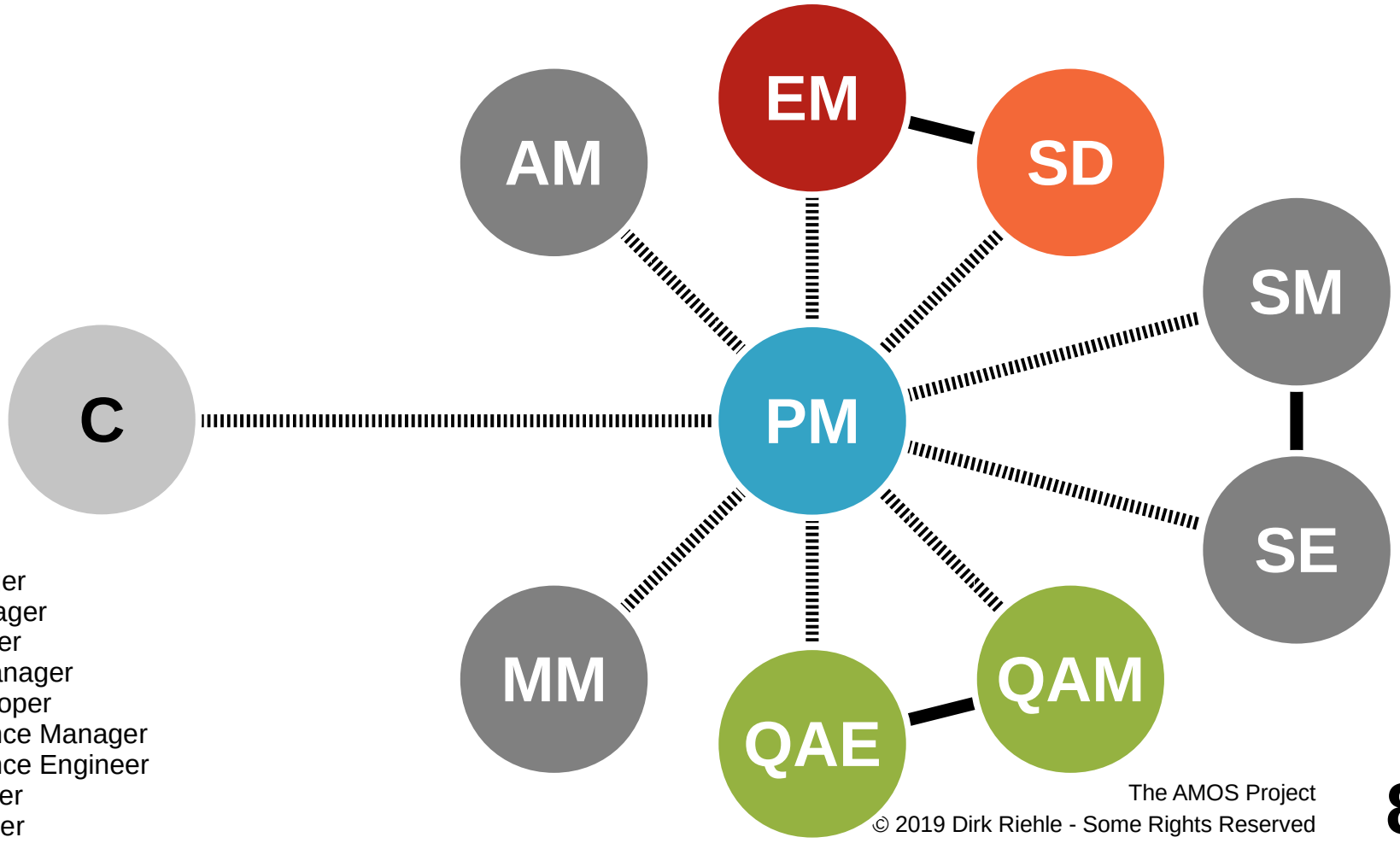
- **Product management**
  - Is the **management** [1] of a company's products
  - Along the **product's life-cycle**
  - Across the **product portfolio** (if any)

[1] The purposeful act, manner, or practice of handling, supervising, or controlling [products, product life-cycles, product portfolios]

What?

What first?

Product Manager in Context



C: Customer
AM: Account Manager
MM: Marketing Manager
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SD: Software Developer
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QAE: Quality Assurance Engineer
SM: Support Manager
SE: Support Engineer

Two Sides of Product Management

1. **Strategic product management**
   - Focuses on assessing and defining the opportunity
   - “Owns” the Marketing Requirements Document
2. **Technical product management**
   - Focuses on defining the product and its features
   - “Owns” the Product Requirements Document

Example Processes and Artifacts

Processes	Artifacts
Opportunity Assessment	Marketing Requirements Document (MRD)
Product Specification	Product Requirements Document (PRD)
Product Roadmapping	Internal Product Roadmap External Product Roadmap
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Marketing Requirements Document (MRD)

1. Basic product idea
2. Market and competition
3. Product architecture
4. Organizational planning

[M06]

Sample Marketing Requirements Document (MRD)

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Version/Date: v3.1, 15-March-2006

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1.2 Strategic Road Map

This project is part of the company's overall plan to penetrate financial and supply chain accounts in North America, where early adopters for futuristic capabilities tend to collect. In addition, it helps us in our core decision support base, which has been waiting for performance improvements to move very large files among planetary systems. Non-Earth customers are a secondary target for the company, and this product.

Product Requirements Document (PRD)

1. Functional Specification
2. Technical Specification
3. Whole Product Package

[A07]

Web Accessibility in WebMail Corporate Edition Product Requirements Document

Document ID	
Version	Version 1.1
URL	
Originator	Matt Anderson
Approval Date	
Status	Draft

ModificationHistory:

Version	Date	Author	Description
1.0	07/30/07	Matt Anderson	Initial Version
1.1	8/31	Larry Herman	cleanup

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1. Introduction

1.1. Definitions, Acronyms and Abbreviations

	Definition
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[E12]

EPRI

Planning Document

Software Requirements Document (SRD)

Sample Template

Instructions:

- Please elaborate on each subject. You may use your own document(s) instead of this sample template.
- If a topic is not applicable to your software, please enter "Not Applicable."
- Please submit this document with the Beta software submittal at the latest.

Software Name:		Revision #:	
Author:			
Date:			
Revision History:		Date:	

Video From “The Pentagon Wars” [1]

The New Bradley Design

(Ten years in the life of a project manager)

[1] See https://youtu.be/Jp5japiHAs4

Video Lessons

- Multiple stakeholders
  - Bargaining leads to suboptimal results
- Meddling stakeholders
  - Intervening in the tank design process
- Unclear market
  - From US military to foreign markets
- Cost explosion
  - With changing requirements, costs explode
- Inconsistent requirements
  - From fast and small to big with firepower
- Changing requirements
  - Lack of focus invalidates prior work
- Feature creep
  - From troop carrier to tank

Engineering Management

Engineering management is the **management**[1] of a company's **product development process** [along the **product life-cycle**] [across a **product portfolio**]. [DR]

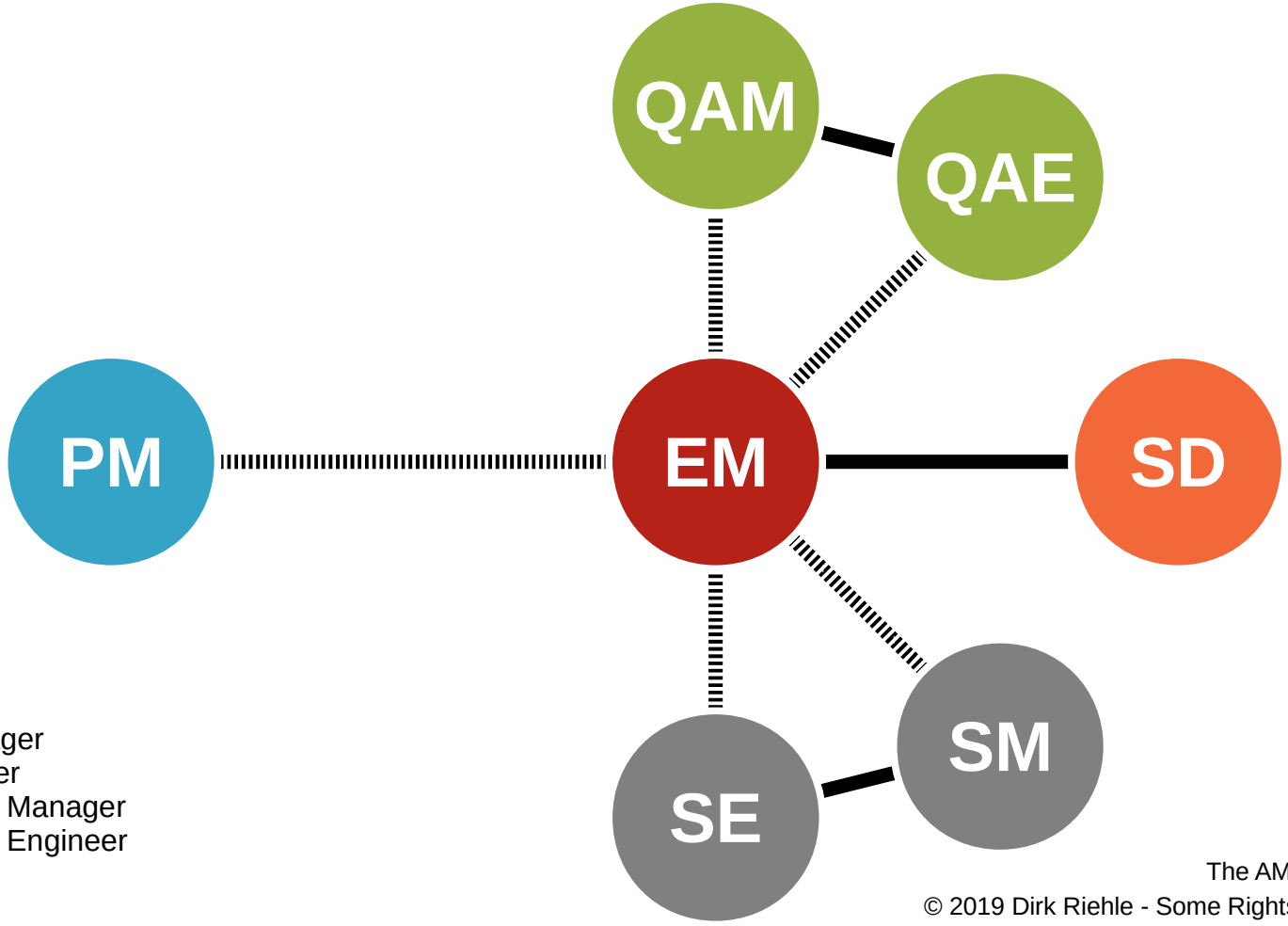
[1] The purposeful act, manner, or practice of handling, supervising, or controlling [developers and engineering processes]

Engineering Management (Simplified)

Who?

By when?

Engineering Manager in Context



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SM: Support Manager
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Example Processes and Artifacts

Processes	Artifacts
Release Planning	Release Plan
Resource Allocation	Project Plan Task Board
Outsourcing	Budget Project Plan
Project Retrospective	Note Book

Software Development

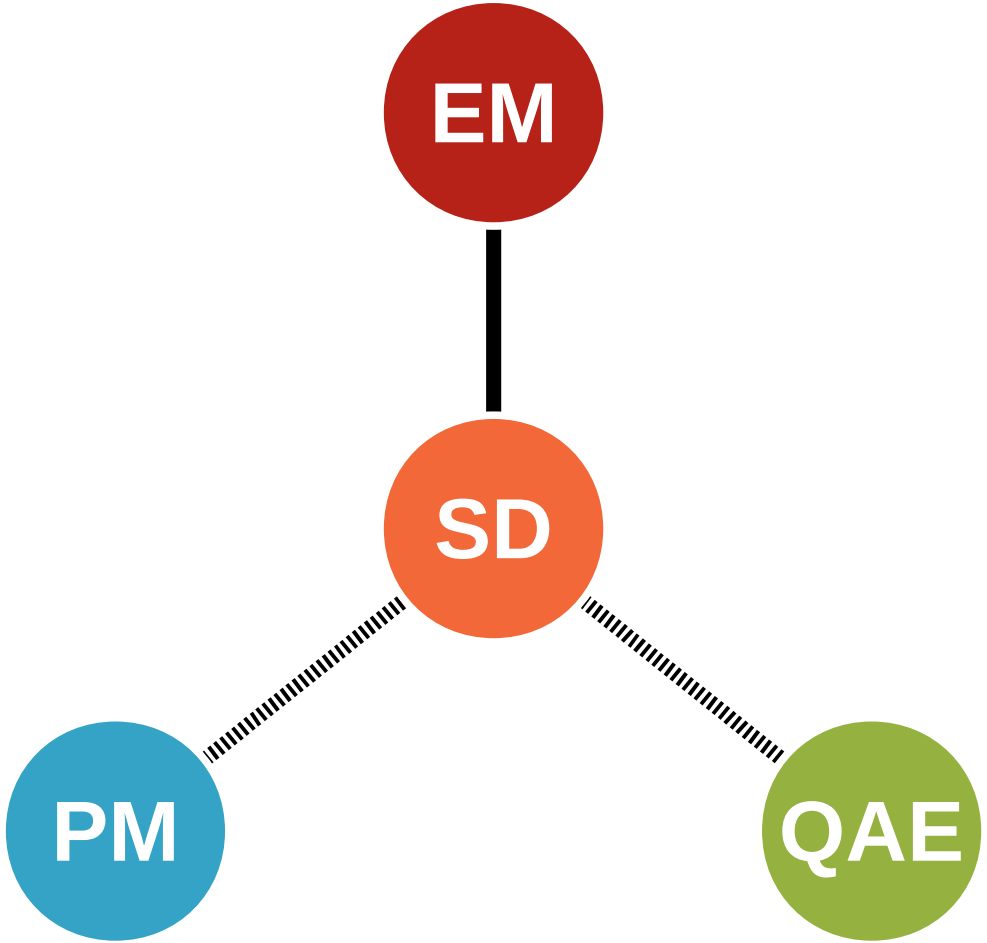
Software development **(programming)** is the process of turning product requirements into working software. [DR]

Software Development (Simplified)

How?

How fast?

Software Developer in Context



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Processes and Artifacts

Processes	Artifacts
Effort Estimation	Release Plan
Programming	Source Code

Quality Assurance

Quality assurance is the process of assuring that the software being developed **has a defined quality.** [DR]

Quality Assurance (Simplified)

Releasable?

Good enough?

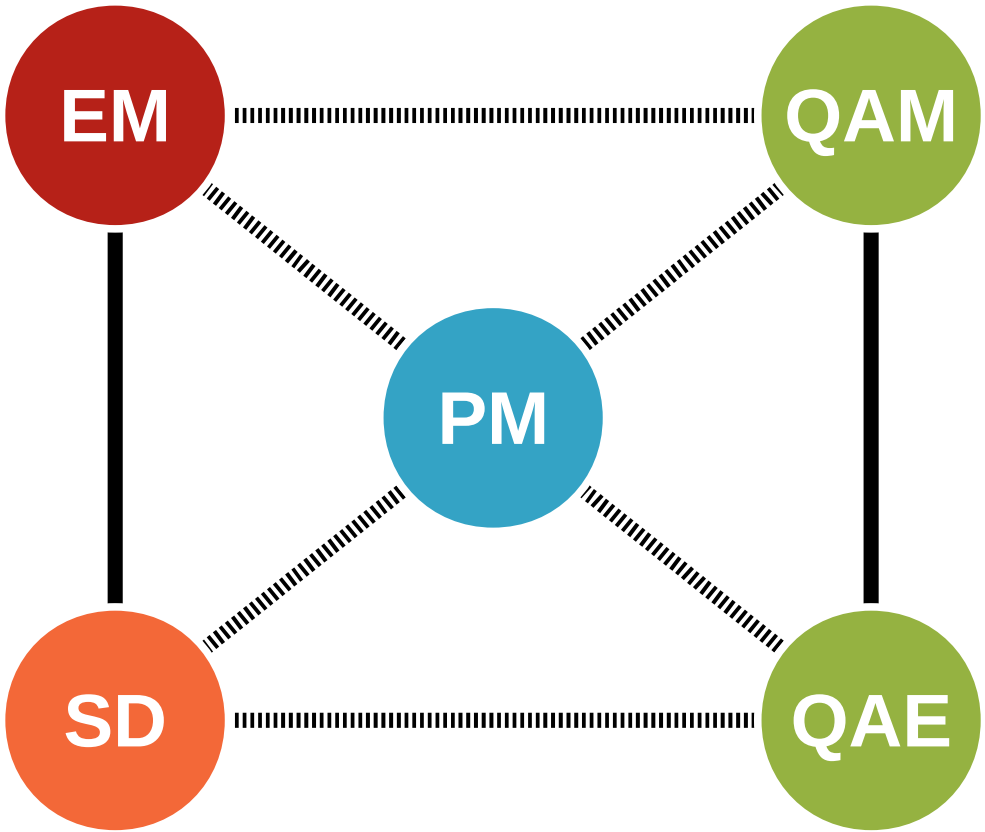
Quality

The **quality** of a software system is the degree to which it **conforms** to its **stakeholders' expectations**. [DR]

Stakeholders and Expectations

- Product management
  - Functional requirements
  - Non-functional requirements
- Engineering management
  - Product quality
  - Maintainability and evolution
- Support and operations
  - Operations costs, usability
  - Non-functional requirements

Quality Assurance in Context



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Processes and Artifacts

Processes	Artifacts
Automated Test Design and Implementation	Test Plan Test Code
Manual Test Design and Implementation	Test Plan Test Script
Release Sign-off	Email
Release Packaging	Software Release

Quiz on Organizational Issues

1. Where in the organizational chart to put product management?
   A) Sales and marketing
   B) Engineering
   C) Stand-alone

2. Where in the organizational chart to put quality assurance?
   A) Engineering
   B) Product management
   C) Stand-alone

Review / Summary of Session

- Key functions and roles in software engineering
  - Product management
  - Engineering management
  - Software development
  - Quality assurance
- Describing process models

Thank you! Questions?

dirk.riehle@fau.de – http://osr.cs.fau.de

dirk@riehle.org – http://dirkriehle.com – @dirkriehle

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  - ...

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Prof. Dr. Dirk Riehle

Friedrich-Alexander University Erlangen-Nürnberg

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It is Friedrich-Alexander University Erlangen-Nürnberg – FAU, in short.

Corporate identity wants us to say “Friedrich-Alexander University”.

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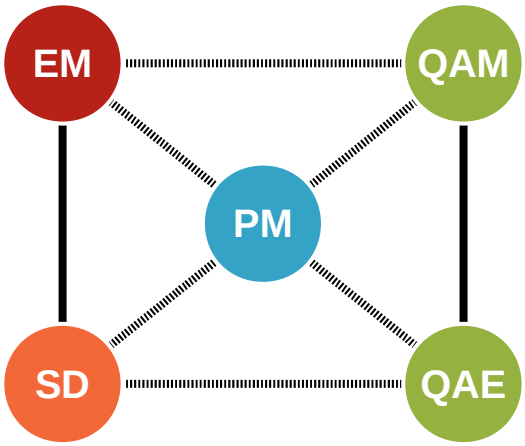
Key Roles in Software Engineering



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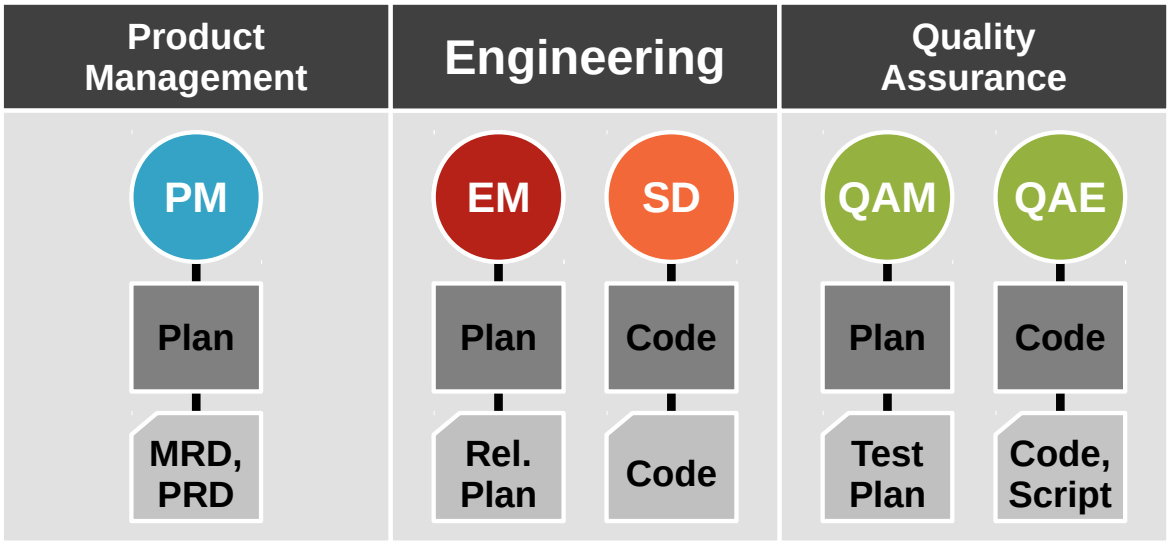

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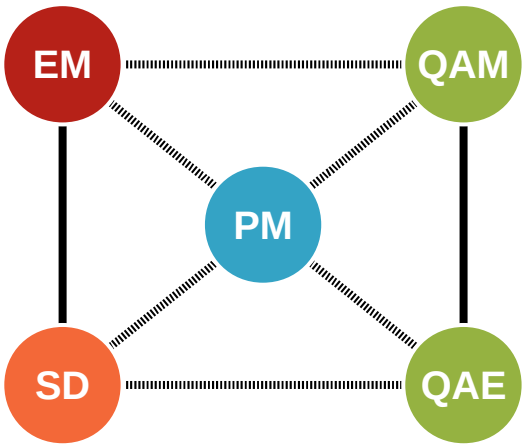

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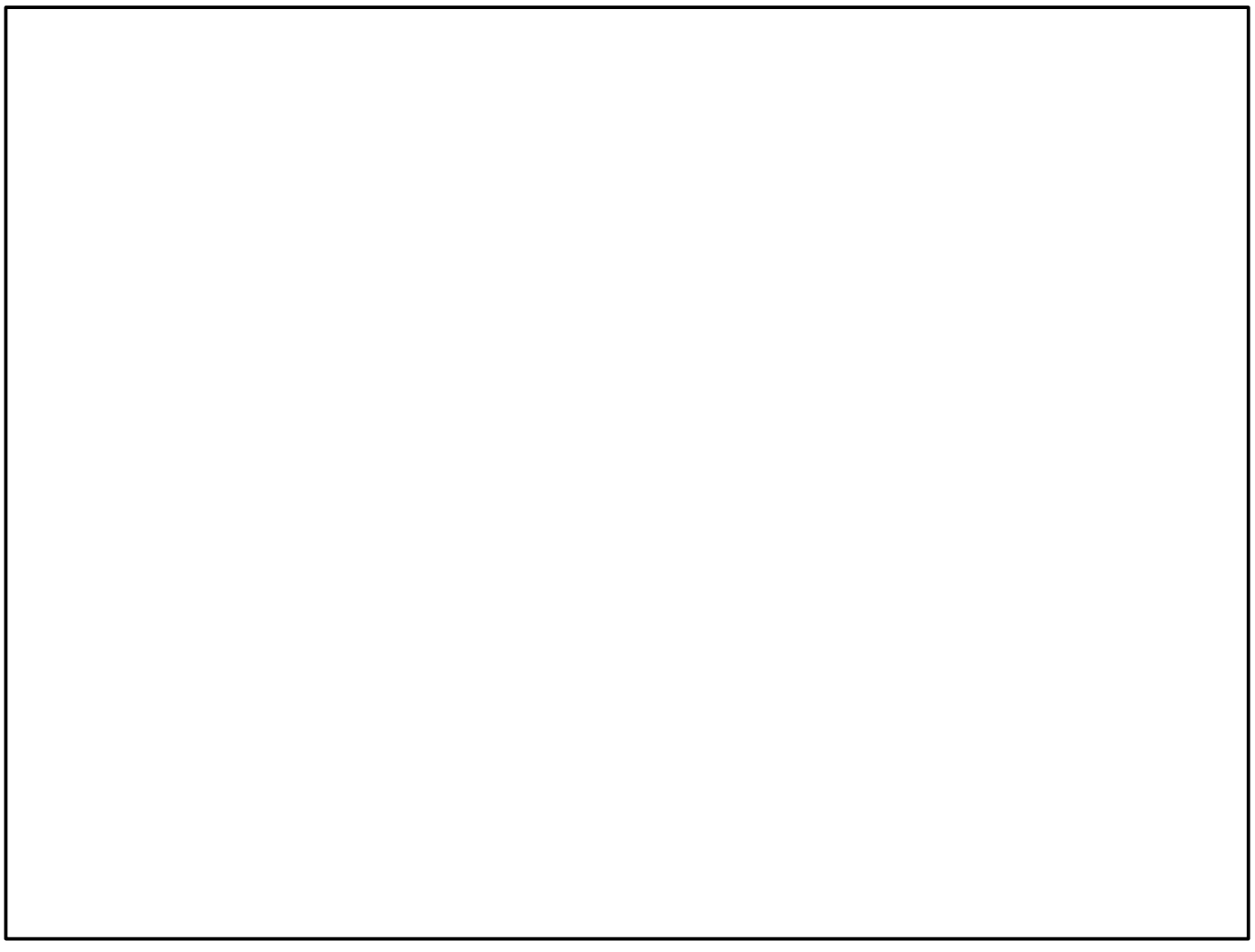
dirk@riehle.org – http://dirkriehle.com – @dirkriehle

DR



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