Software Processes

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AMOS C01

Agenda / Key Functions in Software Engineering

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

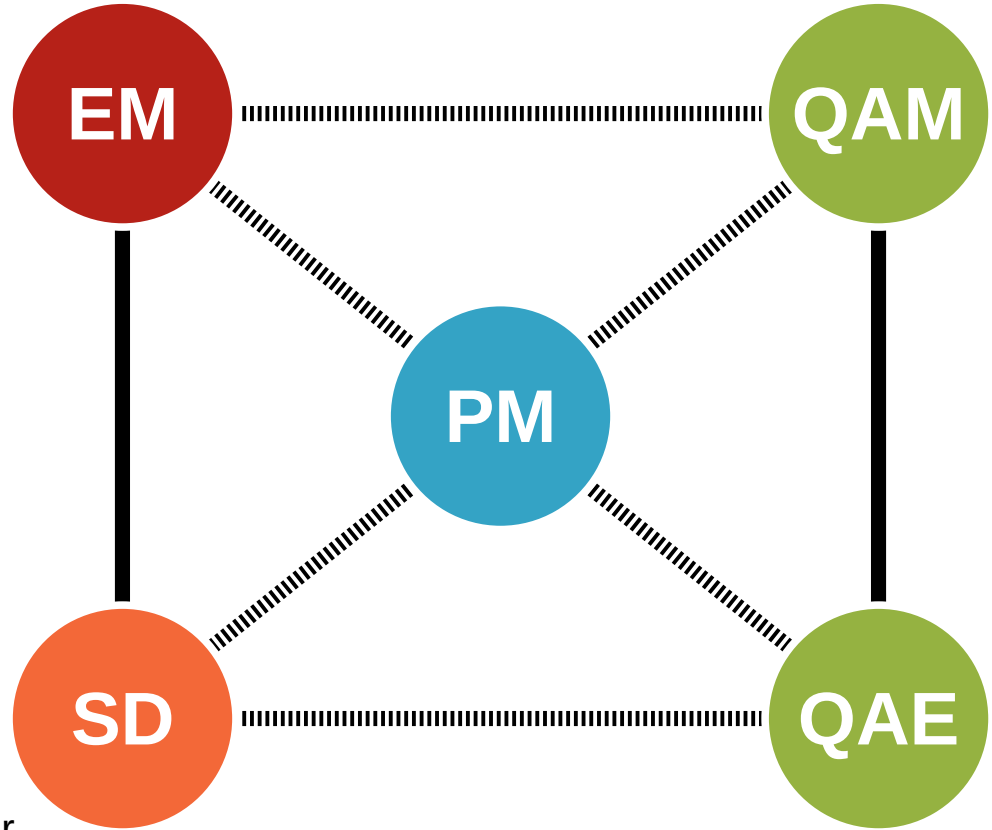
Describing Software Engineering Processes

Roles

Practices

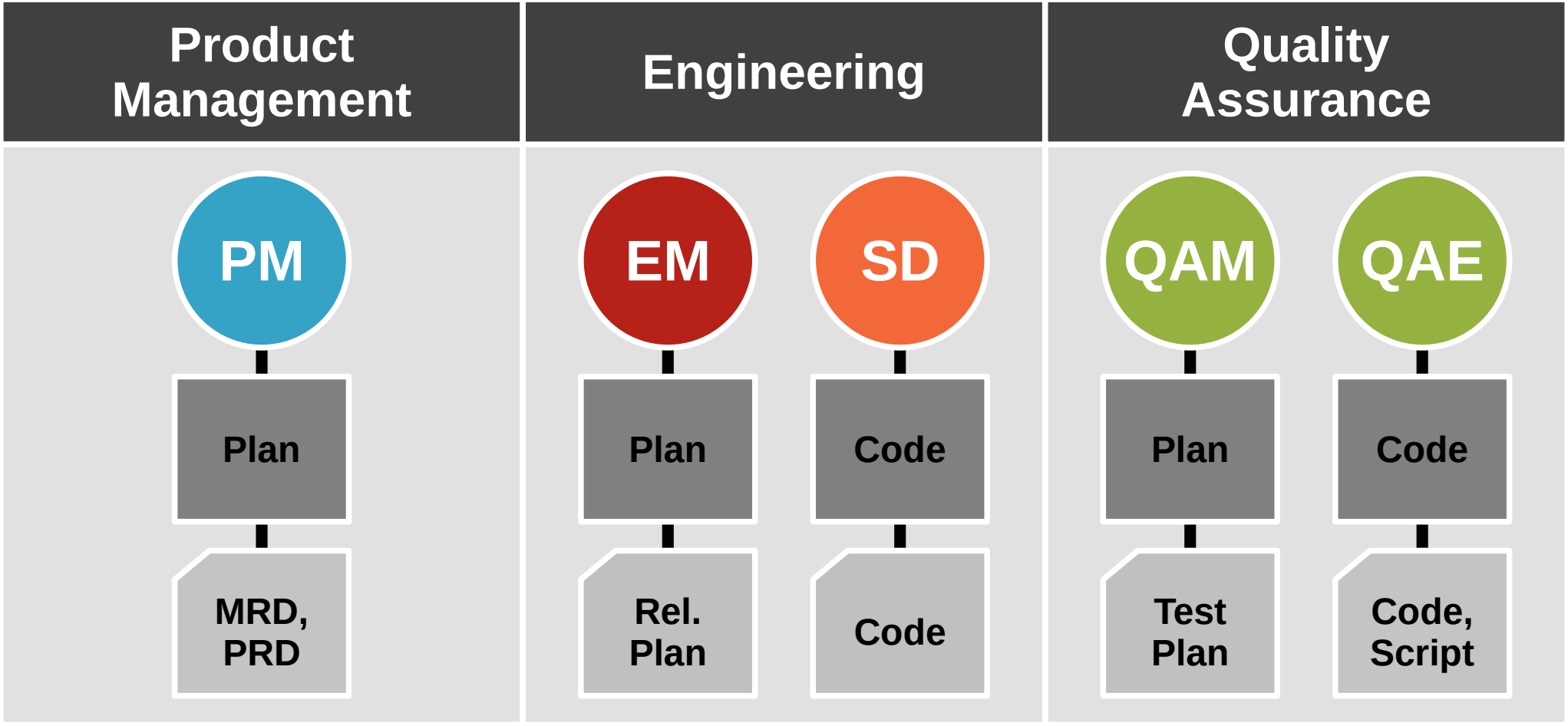
Artifacts

Key Roles in Software Engineering



PM: Product Manager
EM: Engineering Manager
SD: Software Developer
QAM: Quality Assurance Manager
QAE: Quality Assurance Engineer

Key Practices and Artifacts



1. Product Management

Product Management

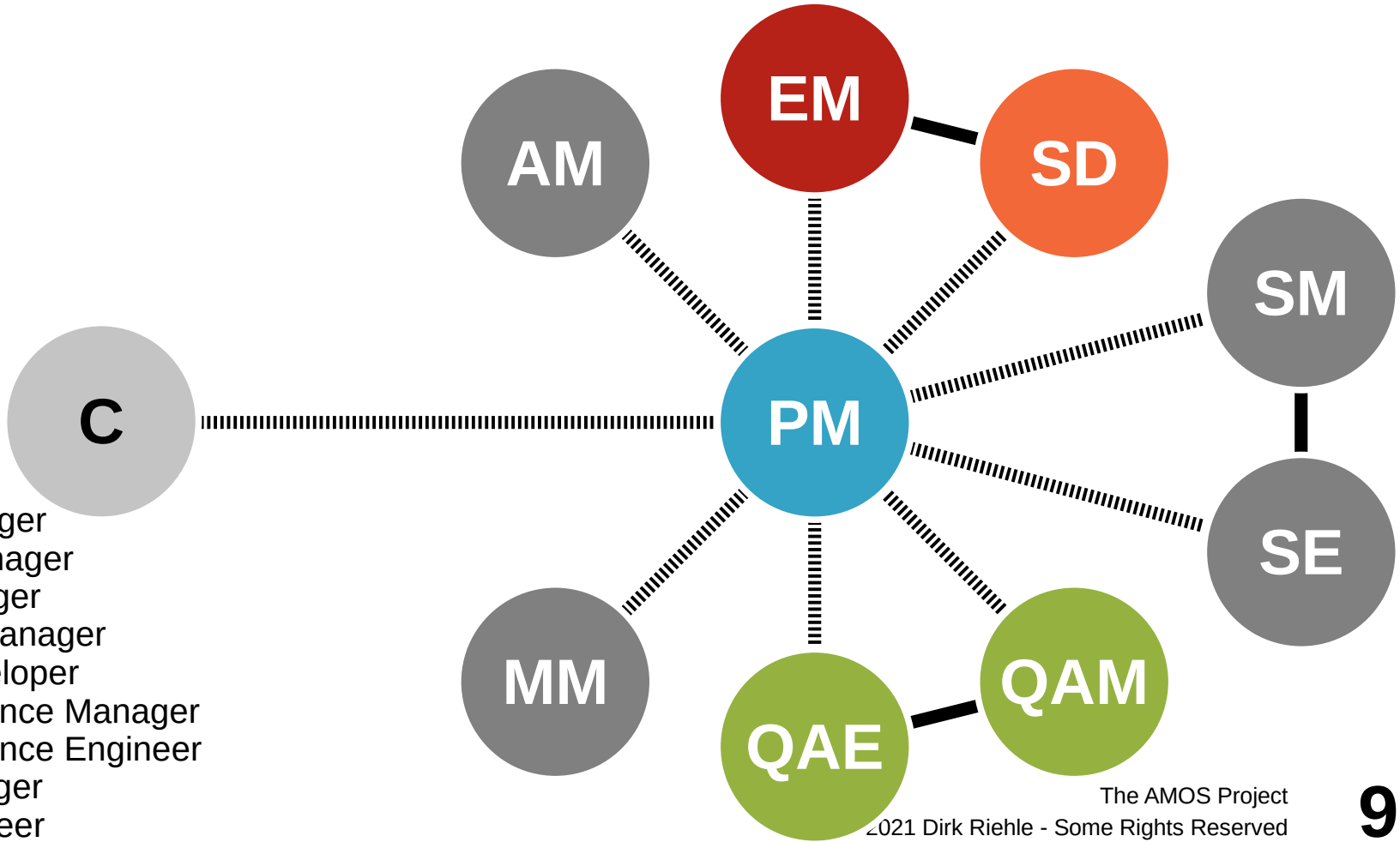
- **Product management**
  - Is the **management** [1] of a company's products
  - Along the **product's life-cycle**
  - Across the **product portfolio** (if any)

[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
PM: Product Manager
EM: Engineering Manager
SD: Software Developer
QAM: Quality Assurance Manager
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
   - Responsible for the Marketing Requirements Document
2. **Technical product management**
   - Focuses on defining the product and its features
   - Responsible for 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
Release Planning	Release Plan

Marketing Requirements Document (MRD)

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

[M06]

Sample Marketing Requirements Document (MRD)

Author/Owner: Rich Mironov, rich@mironov.com
Version/Date: v3.1, 15-March-2006

Abstract:
This product release, code-named "Babylon-6," addresses three top requirements. In order, they are [1] meeting the emerging market need for teleportation, [2] boosting internal quality and supportability through telepathic diagnostics, and [3] increasing networking price-performance. All three are required for successful release and launch, which is planned for next Wednesday.

In addition, a wide variety of other improvements and extensions have been identified. None of these are defined as gating items for the release, so may be postponed if they threaten timeliness or functionality of the release.

Revision History (example)
V1.0 First draft for comment, 01-Jan-2001
V1.5 Incorporating feature order, 18-Sept-2001
V2.0 Coordinated with feature sizing from Development, 22-Mar-2002
V2.1 Revised based on initial alpha tests (liability concerns from Corporate Legal), 15-Apr-2003
V3.0 Redefined for use only on inanimate objects and cargo due to slight side effects, 20-Jun-2004
V3.1 Updated links and website information, 15-March-2006

Table of Contents

1.0 Strategy and Overview

1.1 Goals and Objectives

{A short, easily measured objective echoed from top page.}
This product release, code-named "Babylon-6," addresses three top requirements. In order, they are [1] meeting the emerging market need for teleportation, [2] boosting internal quality and supportability through telepathic diagnostics, and [3] increasing networking price-performance. All three are required for successful release and launch, which is planned for next Wednesday.

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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

TABLE OF CONTENTS

1. Introduction

1.1. Definitions, Acronyms and Abbreviations

	Definition
ADA	**The Americans with Disabilities Act** - Signed into law on July 26 1990, the Americans with Disabilities Act is a wide-ranging legislation intended to make American Society more accessible to people with disabilities.

[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/r0op8e0LuoU

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

2. Engineering Management

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]

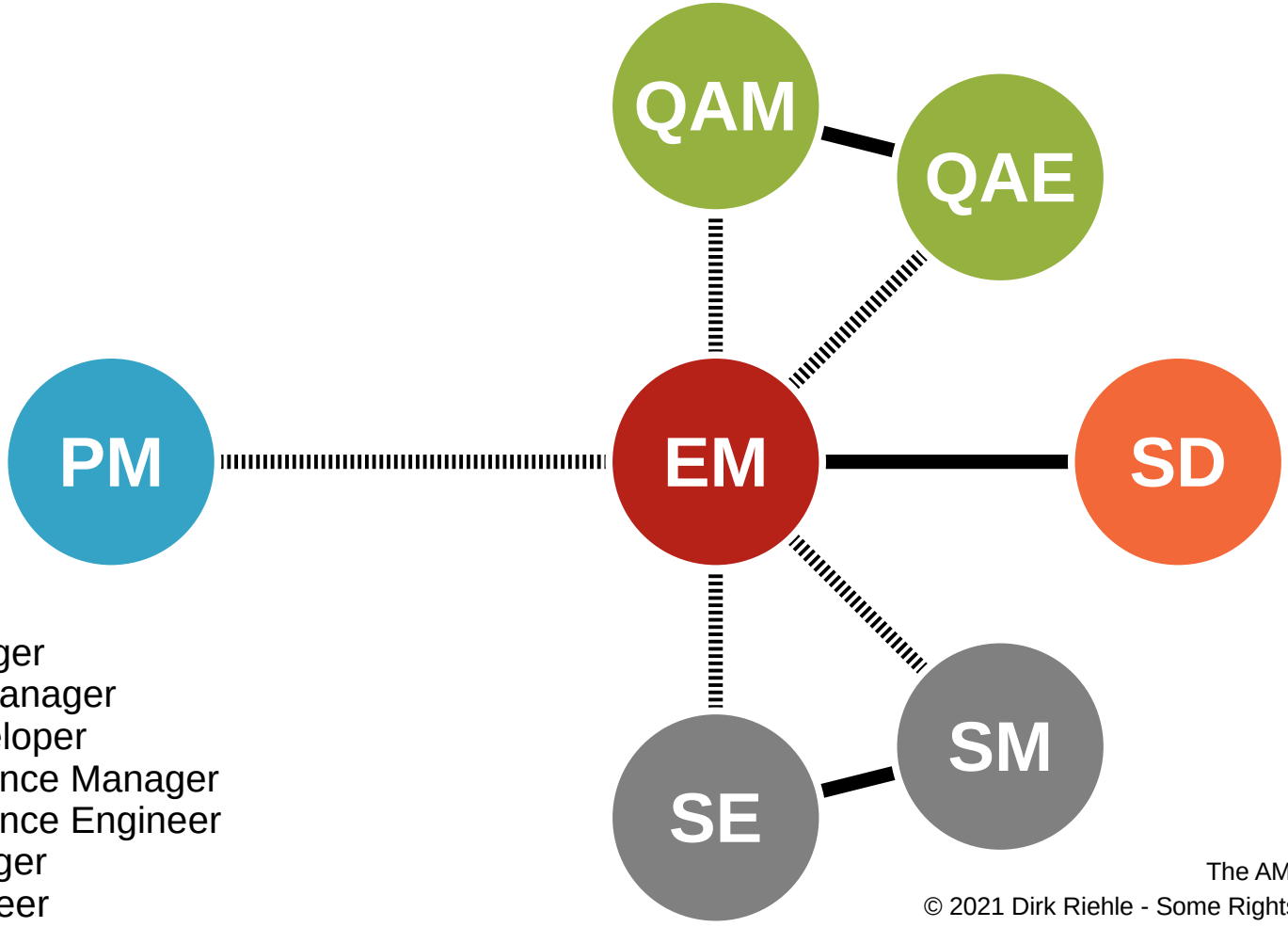
[1] The purposeful act, manner, or practice of handling, supervising, or controlling [developers and engineering processes]

Engineering Management (Simplified)

Who?

By when?

Engineering Manager in Context



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Example Processes and Artifacts

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

3. Software Development

Software Development

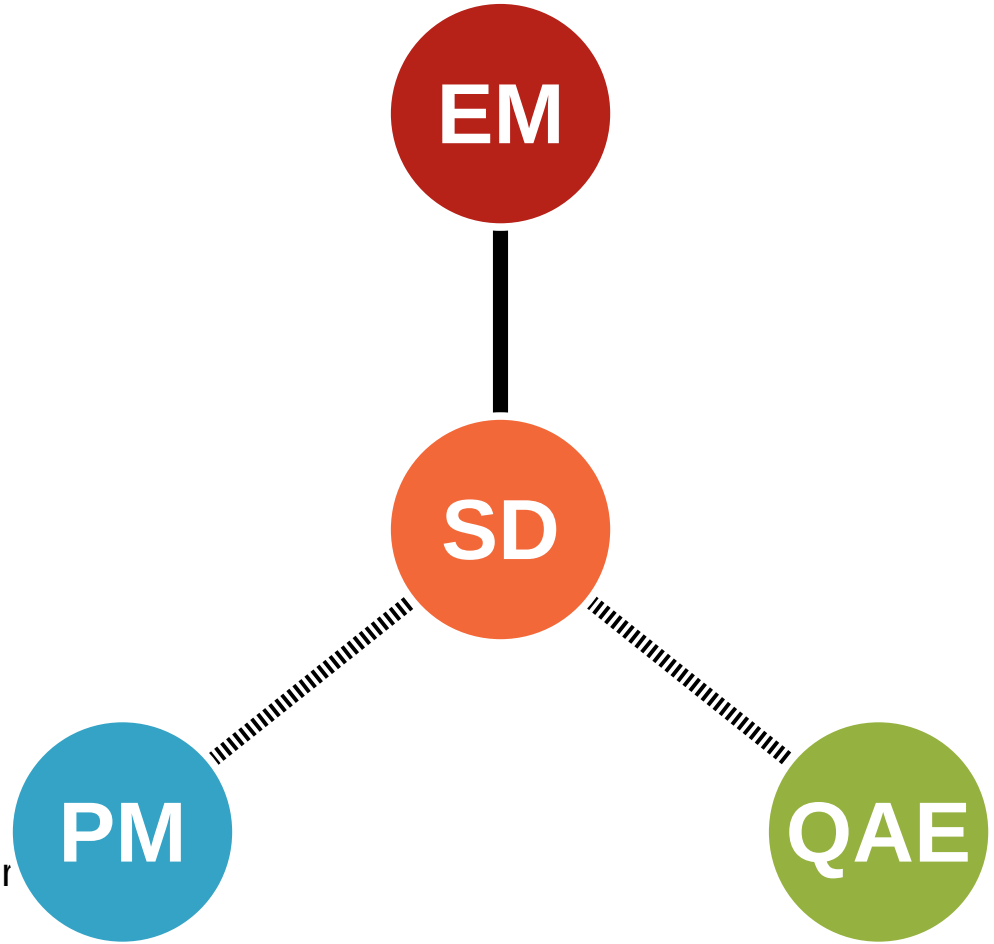
Software development **(programming)** is the process of turning product requirements into working software. [DR]

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

4. Quality Assurance

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?

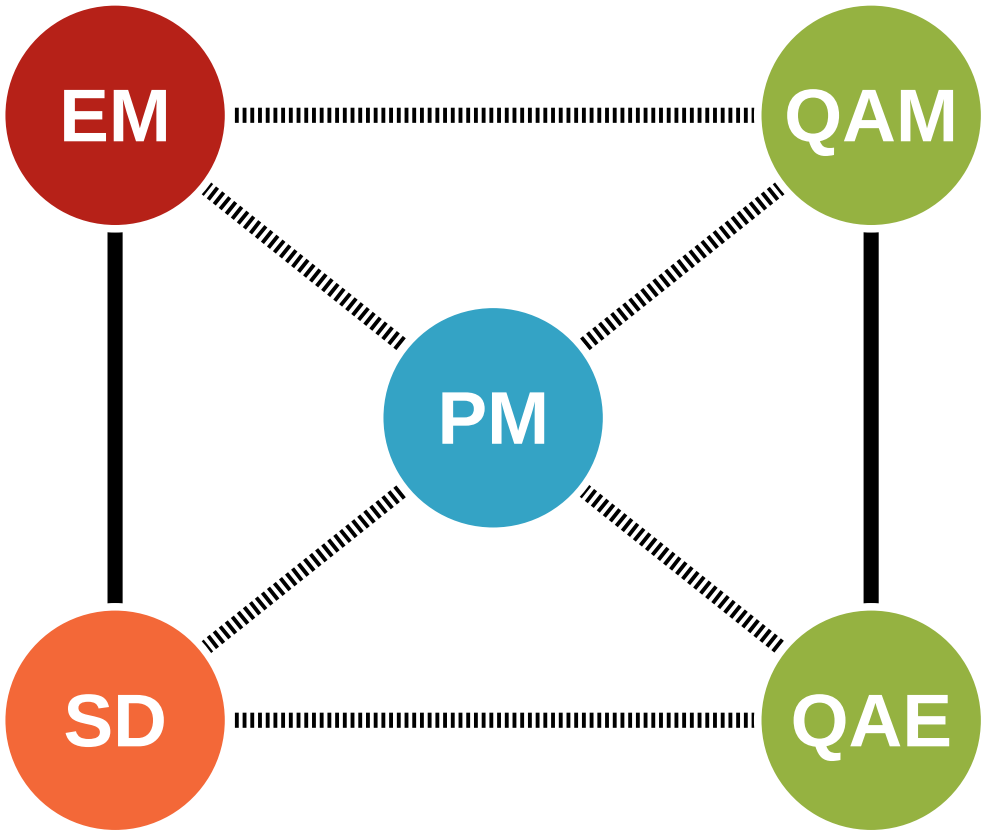
Quality

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?

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