

Software Processes

Prof. Dr. Dirk Riehle

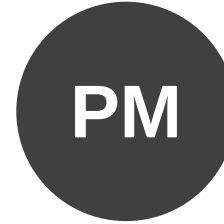
Friedrich-Alexander University Erlangen-Nürnberg

AMOS C01

Licensed under [CC BY 4.0 International](#)

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

Roles



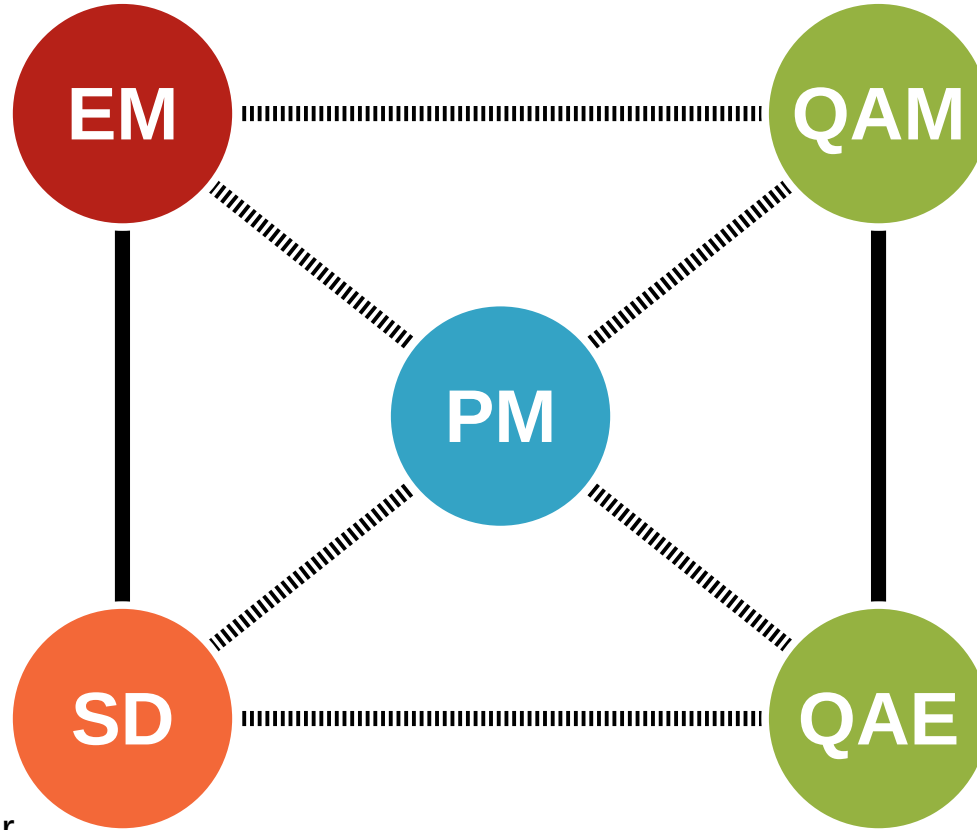
Practices



Artifacts

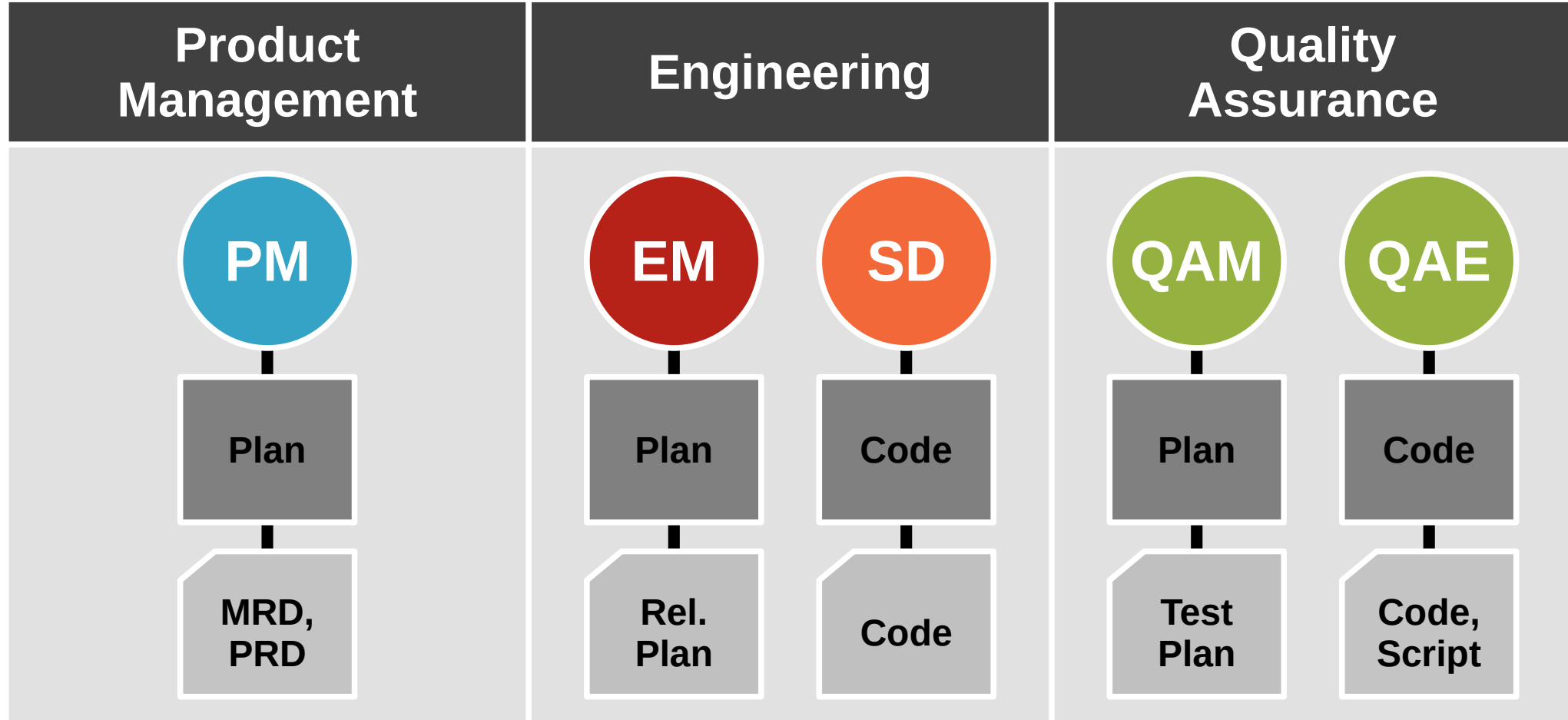


Key Roles in Software Engineering



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

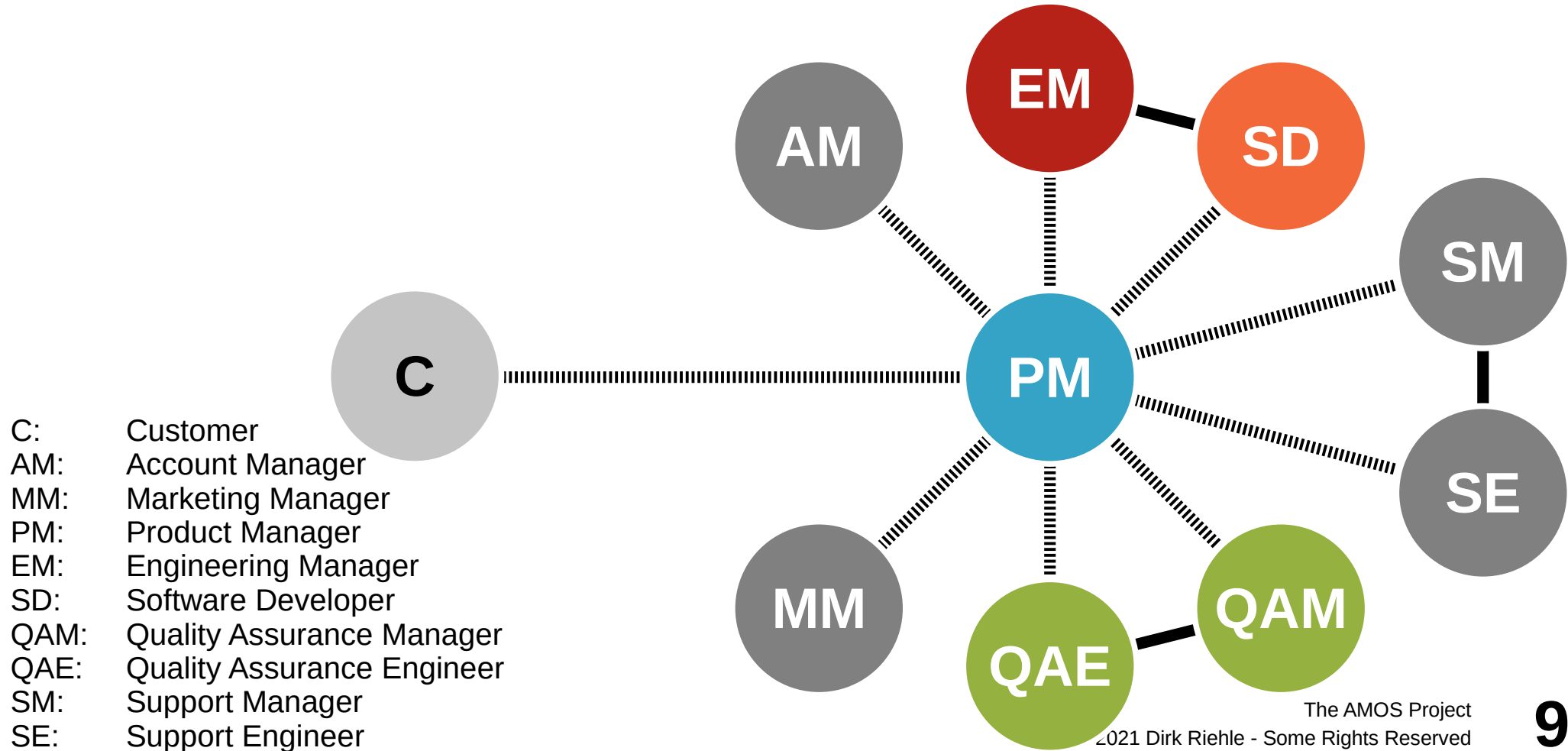
- **Product management**
 - Is the **management** [1] of a company's products
 - Along the **product's life-cycle**
 - Across the **product portfolio** (if any)

[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



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

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

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

© 1996-2006, Rich Mironov.

Table of Contents

1.0 Strategy and Overview.....3
1.1 Goals and Objectives3
1.2 Strategic Road Map.....3
1.3 Customer Categories (User Profiles or Personas).....3
1.4 Competitive Strengths and Weaknesses.....4
1.5 External Positioning.....4
1.6 Microsoft.....4
2.0 Business Model.....4
2.1 Value Proposition.....5
2.2 Market Segment.....5
2.3 Value Chain Structure5
2.4 Cost Structure.....5
2.5 Position within the Value Network.....5
2.6 Competitive Strategy.....6
3.0 Affected Groups.....6
3.1 Development.....6
3.2 Marketing & Sales.....6
3.3 Support.....6
3.4 Operations.....6
3.5 Sales.....6
3.6 Legal.....7

4.0 Bill of Materials.....7
4.1 Transporter Server.....7
4.2 Transporter Console/GUI.....7
4.3 Sound Generator.....7
4.4 Demographic Upsell Module (DUM).....7
5.0 Internally Committed Requirements.....7
5.1 Elimination of Top 5 High-Priority Bugs.....8
5.2 Internal Performance Improvements.....8
5.3 Backward Compatibility.....8
5.4 Next-Generation Architectural Changes.....8
5.5 Platforms and Protocols.....8
5.6 End-of-Life for Older Versions.....9
5.7 Uptime and Quality of Service.....9
6.0 Externally Committed Requirements.....9
6.1 Molecular Transmittal.....9
6.2 Voice-Activated Debug Mode.....9
6.3 Broad Performance Improvement.....10
6.4 Auto-Upgrade Feature.....10
6.5 Benchmarks.....10
6.6 Metering Support for ASP Model.....10
7.0 Highly Desirable Requirements.....10
7.1 Status Indicators.....10
8.0 Future Requirements.....11
8.1 Undo/Redo.....11
9.0 Features Not Being Implemented.....11
9.1 Random Transformation.....11

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.

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.

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.

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

Web Accessibility in
WebMail Corporate Edition
Product Requirements Document

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

Modification History:

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

TABLE OF CONTENTS

TABLE OF CONTENTS.....2

1. INTRODUCTION.....4

1.1. DEFINITIONS, ACRONYMS AND ABBREVIATIONS.....4

1.2. LOCATION OF DOCUMENT.....5

1.3. TARGET AUDIENCE.....6

1.4. SIGNOFF.....6

2. REFERENCES AND RELATED DOCUMENTS.....7

2.1. EXISTING FEATURE ENHANCEMENTS AND BUGS.....7

2.2. INTERNAL REFERENCES AND RELATED DOCUMENTS.....7

2.3. EXTERNAL REFERENCES AND RELATED DOCUMENTS.....7

3. ASSUMPTIONS AND CONSTRAINTS.....8

3.1. ASSUMPTIONS.....8

3.2. HARDWARE CONSTRAINTS.....8

3.3. SOFTWARE CONSTRAINTS.....8

4. OVERVIEW.....9

4.1. FEATURE DESCRIPTION.....9

4.2. BUSINESS NEED.....9

4.3. TECHNICAL CHALLENGES/ISSUES.....10

5. REQUIREMENTS.....11

5.1. SPECIFIC FUNCTIONS AND FEATURES.....11

5.2. LOCALIZATION REQUIREMENTS.....21

6. DOCUMENTATION.....22

6.1. ADMINISTRATIVE DOCUMENTATION.....22

6.2. PROTOCOL DOCUMENTATION.....22

6.3. END-USER DOCUMENTATION.....22

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.

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.

1.0 Introduction 1

2.0 Team Members 1

3.0 Assumptions, Constraints, Schedule and Design..... 1

 1.1 Assumptions1

 1.2 Constraints1

 1.3 Schedule2

 1.4 Design.....2

4.0 General System Description 2

 1.5 System Context3

 1.6 System Environments and Modes3

 1.7 User Characteristics3

 1.8 Operational Scenarios3

 5.5 Standards, Procedures, and Processes Used in this Project3

5.0 Functional Requirements 3

6.0 Interface Requirements 4

7.0 Data Management 4

8.0 Non-Functional / Operational Requirements 4

 1.9 Security, Availability, Reliability, Recoverability and Business Continuity....4

 1.10 Maintenance and Support4

 1.11 Performance, Capacity and Scalability.....4

 1.12 Technical Reviews, Audits, and Walk-Through5

9.0 Training 5

10.0 SQA Requirements 5

 1.13 Quality Plan.....5

 1.14 Test Plan5

 1.15 Testing Schedule:6

 1.16 Documentation Plan.....6

 1.17 Delivery, Installation, and Acceptance.....6

11.0 Appendices 6

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

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

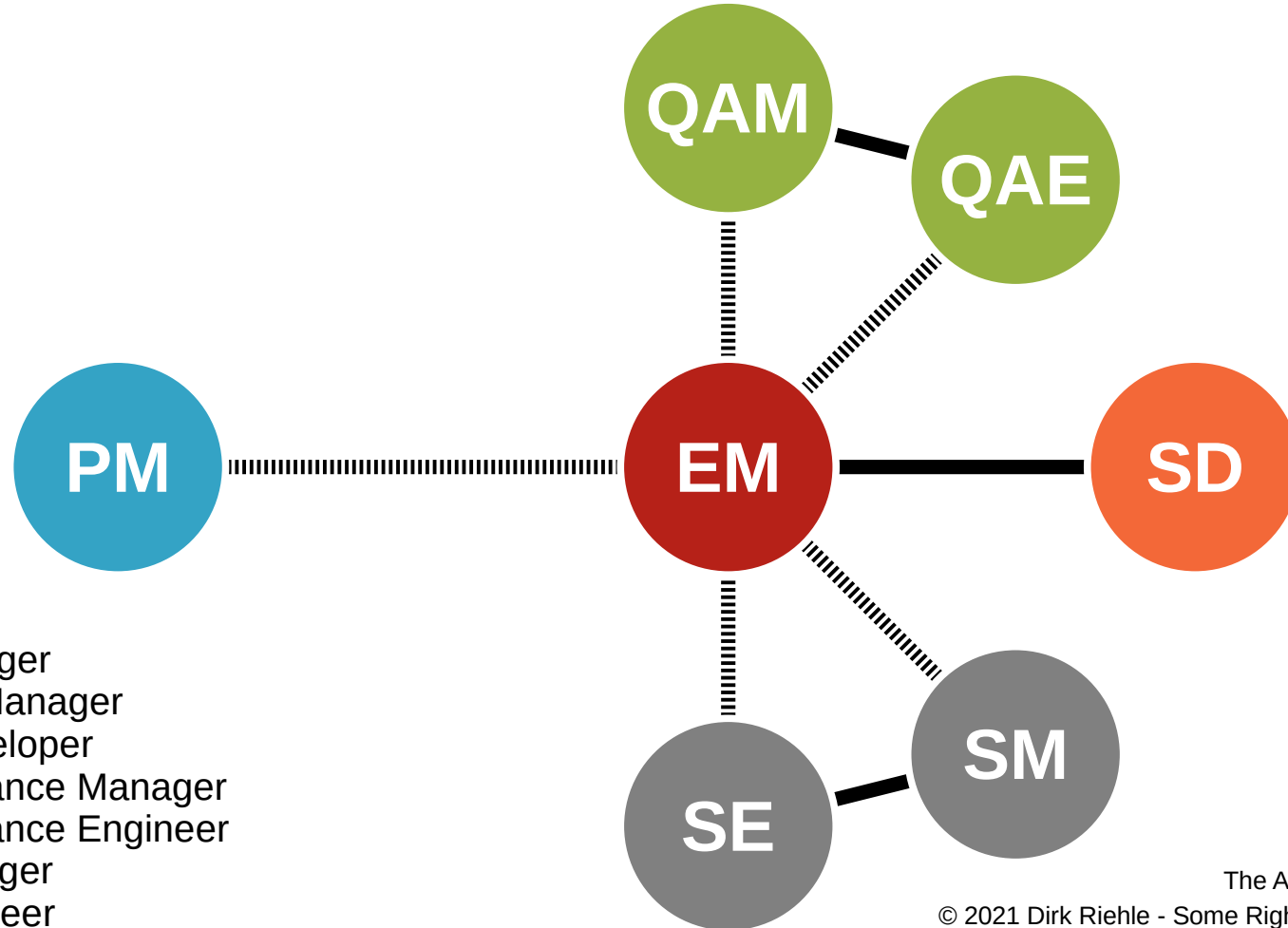
Engineering management is the management^[1] of a company's **product development process** [along the **product life-cycle**] [across a **product portfolio**]. [DR]

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

Who?

By when?

Engineering Manager in Context



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

Example Processes and Artifacts

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

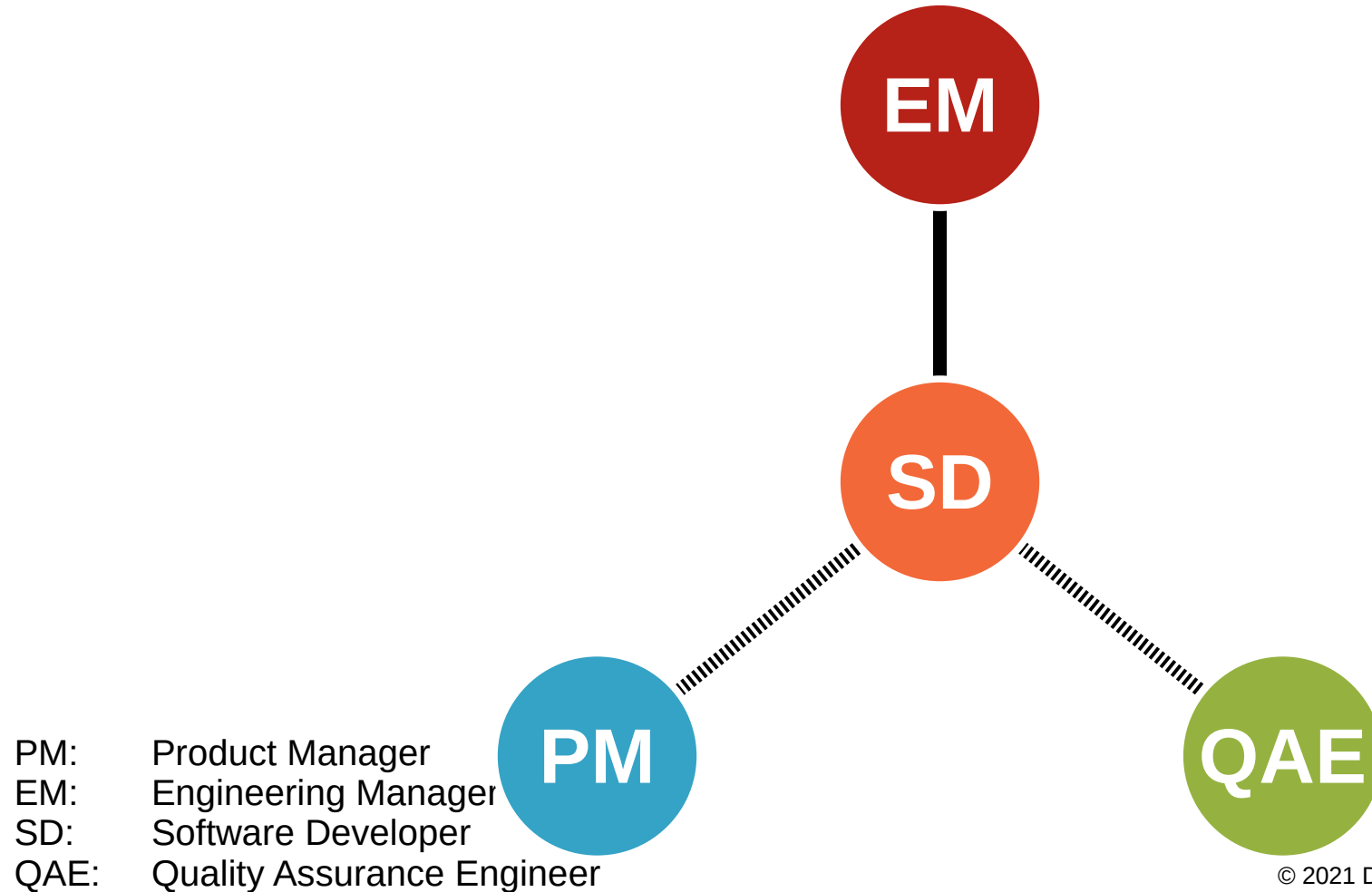
3. Software Development

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

How?

How fast?

Software Developer in Context



Processes and Artifacts

Processes	Artifacts
Effort Estimation	Release Plan
Programming	Source Code

4. Quality Assurance

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

Releasable?

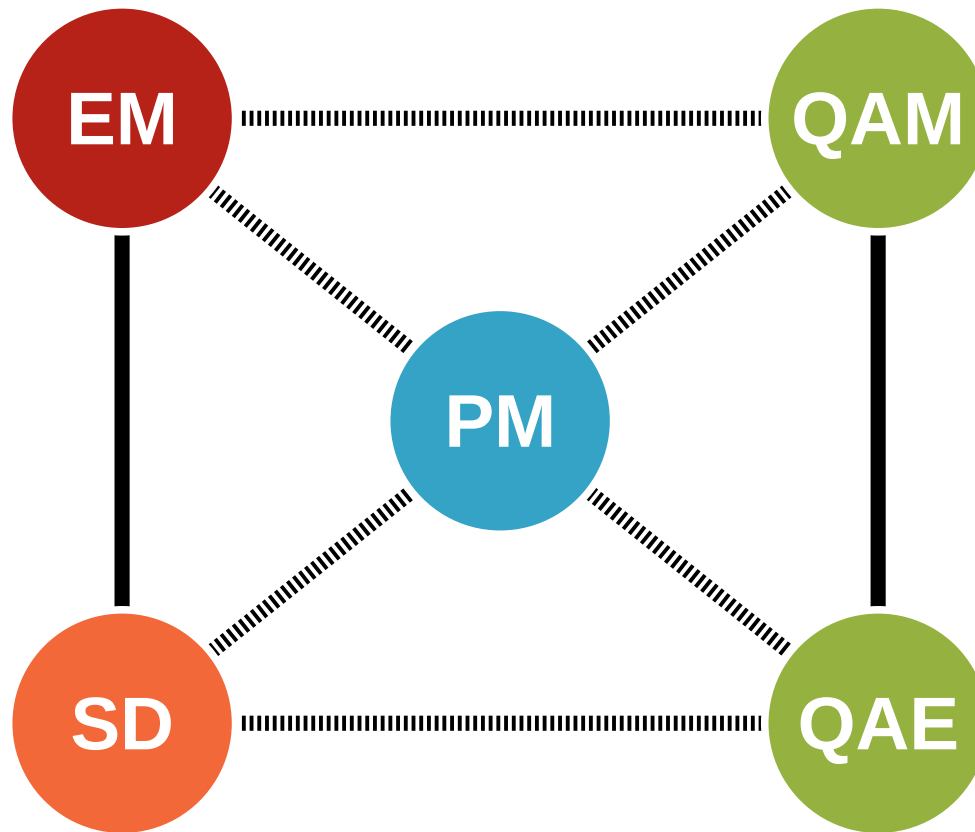
Good enough?

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



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

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](#)

Credits and License

- Original version
 - © 2021 Dirk Riehle, some rights reserved
 - Licensed under [Creative Commons Attribution 4.0 International License](#)
- Contributions
 - None yet