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Manufacturing Domain

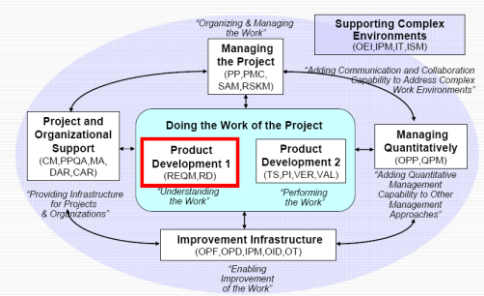
S/W Quality Improvement with the extension of RM System

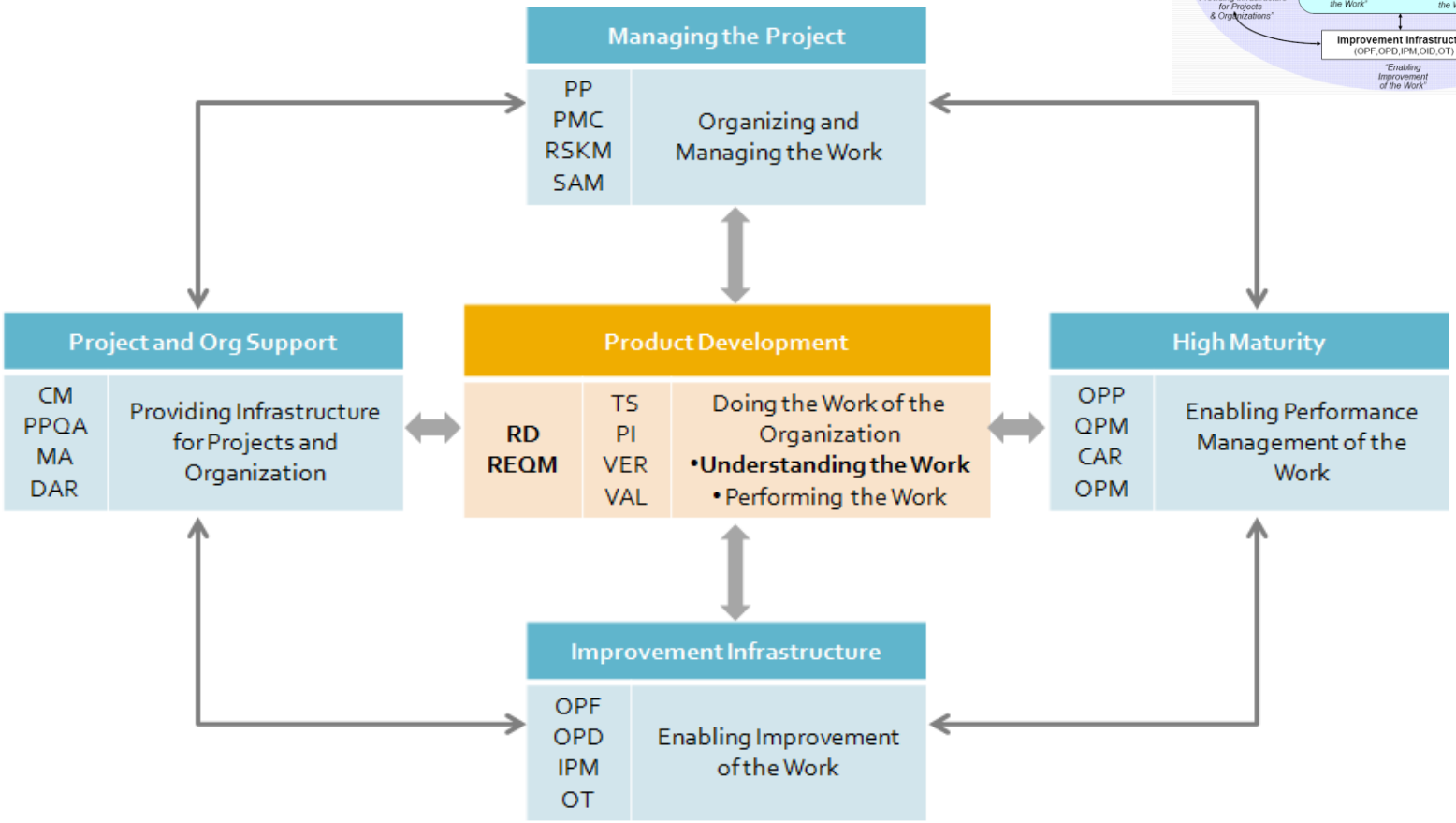
Contents

- Overview
- Requirement Engineering Process
- 2-Dimensional Extension
- Wrap up
- Question and Answer

Overview

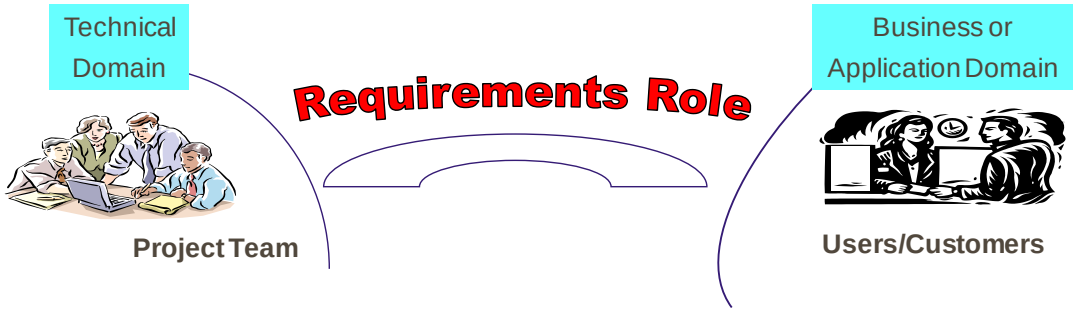
- Understand the work





Overview

- Requirement
  - Requirements are a means of communicating across cultural boundaries and reaching agreement



  - Requirements should serve as an effective means of communication & commitment for both the project team and the users / customers
- Type of Requirements

TERM	DEFINITION
Functions	Capabilities required of a product in terms of function or service
Attributes (Non-functional)	Quality characteristics of the product
Technical constraints	Capabilities of the product in terms that drive development (e.g., performance requirements, design constraints)
Non-technical constraints	Requirements related to product, delivery, and production (e.g., cost and schedule)

Overview

- USA Project Performance

Reasons Challenged	%	Reasons Canceled	%
Lack of User Involvement	13	Incomplete Requirements	13
Incomplete Requirements	12	Lack of User Involvement	12
Changing Requirements	12	Lack of Resources	11
Lack of Executive Support	8	Unrealistic Expectations	10
Technological Incompetence	7	Lack of Executive Support	9
Lack of Resources	6	Changing Requirements	9
Unrealistic Expectations	6	Lack of Planning	8
Unclear Objectives	5	Did not need any longer	6
Unrealistic Timeframes	4	Lack of IT Management	6
New Technology	4	Technology Illiteracy	4
Other	23	Other	10

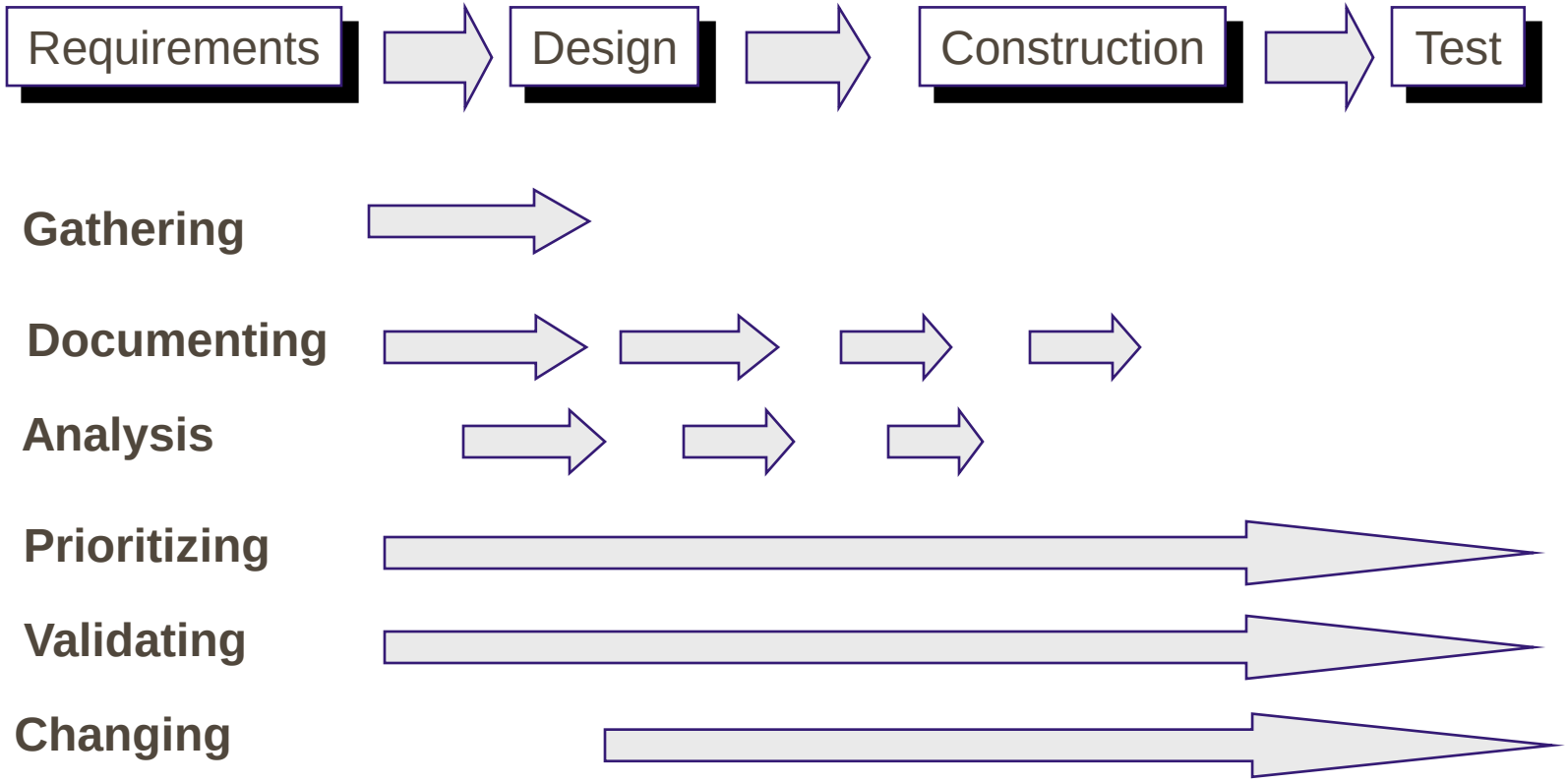
Standard Group CHAOS 1998 research report

Overview

- 요구공학 프로세스가 잘 수행되지 않으면...
  - 명확하게 정의되지 않은 요구사항으로 인하여 생기는 고객과 프로젝트 팀 사이의 혼선
  - 설계, 구현, 시험활동 담당자들 가운데 요구사항에 대한 일관성이 없는 해석
  - 제품 설계에 대한 합의가 과도하게 오래 걸림
  - 사용자를 만족하지 못하는 상품성이 없는 제품 출시
  - 프로젝트 기간 동안 많은 재 작업 발생
  - 요구사항 변경이 무질서하게 일어남
  - 요구사항 변경으로 인하여 프로젝트 범위가 늘어남
  - 제품이 요구사항을 만족하는지에 대한 정확한 판단이 어려움

Requirement Engineering Process

- Requirement During the Life Cycle



Requirement Engineering Process

- Gathering Requirements
  - identify the problem
  - identify user constituencies
  - identify types of information needed
  - determine gathering/Eliciting techniques

Techniques	Description
Interview	소수의 관련그룹으로부터 직접적으로 정보를 파악하고, 수집하고자 할 때
Questionnaires	다수의 인원을 대상으로 데이터를 수집하기 위한 방법
Workshop	짧은 시간 내에 집중적으로 요구사항을 도출하고 피드백 받아야 할 때
Brainstorming	창의적인 생각이 요구될 때 사용되는 방법
Prototyping	Demo를 통해 User I/F 관련한 Issue들에 대해 논의 가능
Storyboarding	고객이 생각하는 것을 시각화 하고자 할 때

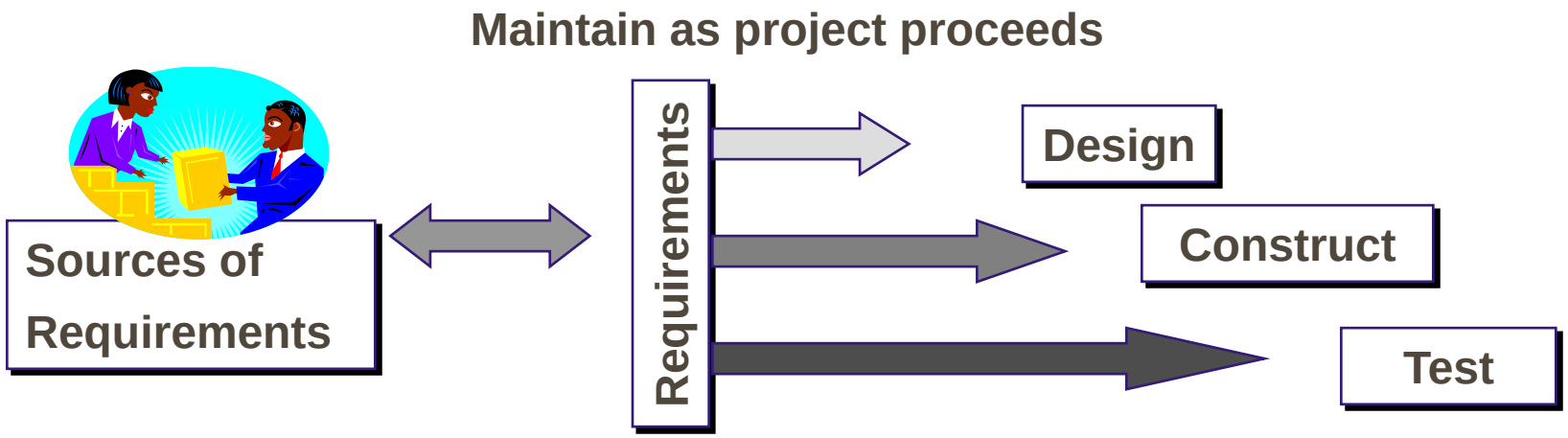
Requirement Engineering Process

- Source for Gathering

Method	Description
Benchmarking, Re-Engineering	Identifying requirements from exiting products or systems
Marketing and sales input	Representatives regularly meet with users to get suggestions and needs
User group	Collections of users who convene periodically to discuss the product and improvements
Trade show	Users exposed to mock-ups and prototypes and asked for feedback
Focus group	Small group of potential users, with moderator to discuss product ideas; structured questions
Facilitated Team	Structured workshop or meeting with users to elicit requirements
User Representative	One who defines user goals and needs to developers
Support Line	Customer support, help desk, bulletin board
Surveys	Textual surveys to sample of users
Interviews	1-1 with user or other interested party
Requirements Prototyping	Users use demo to discover requirements or user interface issues
Pilots and Testing	Feedback and requirements from early pilots
Observational study	Users followed for extended period to learn what they do
Contextual Inquiry	Users interviewed and observed while in their work context
Usability Lab	Special labs for studying subjects at work

Requirement Engineering Process

- Document & Analyze Req.
  - identify strategies for ensuring sound requirements
  - define methods for tracing requirements
  - define user requirements format and content
  - define technical requirements format and content
  - Document what, not why, not how
- Tracing Requirements Backward to the Source



Requirement Engineering Process

- Prioritize Requirements
  - define and perform methods for rating requirements
  - Criteria should be based on customer needs and cares
  - 시간이 오래 걸리고 Critical한 것을 먼저 개발하는 것이 원칙
  - 80-20 rules: 20%의 Requirement가 전체 시스템 80%의 Benefit을 좌우함
  - Prioritization Matrix Approach

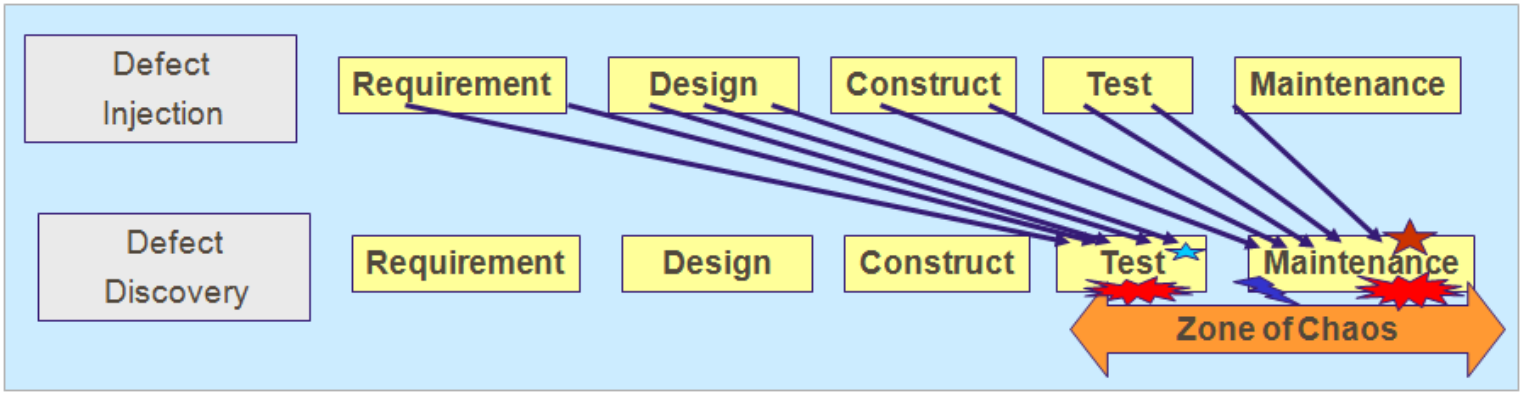
	Criteria (2)			Computed Results	Rank 1-n
	A	B	C		
Weights (3)	1.2	.5	1.3		
R1- New option for save (1)	5	3	3	6+1.5+ 3.9=11.4 (5)	2 (6)
R2- Context-sensitive help	1	5 (4)	3	1.2+2.5+ 3.9=7.6	4
R3- Power PC platform	3	1	5	3.6+5+ 6.5=10.6	3
R4- Redo messages in Spanish	5	5	4	6+2.5+ 5.2=13.7	1

1) 우선순위를 매길 요구사항들을 식별한다
2) 요구사항들의 우선순위를 판단할 기준(criteria)을 선정한다.
3) 기준(criteria)의 상대적인 중요도를 파악하여 경중을 결정한다
4) 1~ 5 점 사이에서 개인별로 각각의 요구사항의 기준에 점수를 매긴다.
5) 각각의 요구사항에 대해 기준의 비중과 점수를 합한다.
6) 요구사항의 우선순위가 점수에 따라 결정된다.

A: quick time to market
B: time for customer to learn new features
C: level of change

Requirement Engineering Process

- Verify & Validate Req.
  - define activities to validate each level of requirement (testing)
  - define activities to verify requirements at each level (reviews)
  - plan and perform the validation and verification activities
  - Use Validation to Avoid the "Zone of Chaos"

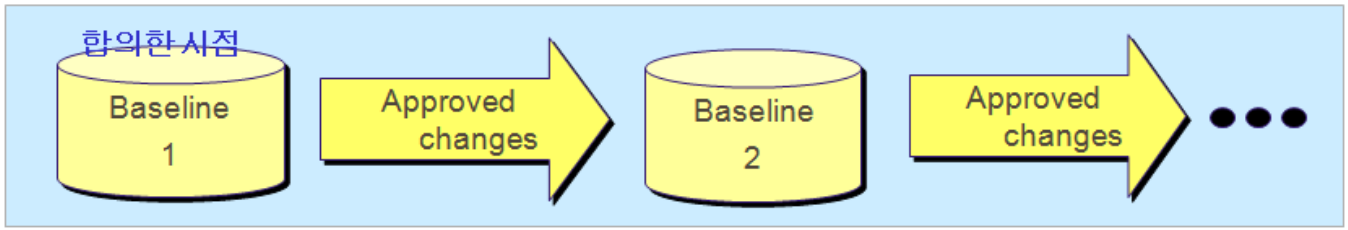


  - Methods to Validate Requirements
    - Use Cases, 동료검토 (Walkthrough, Inspection), Prototyping etc

Requirement Engineering Process

- Manage Requirements
  - document the commitment process
  - define requirements baseline contents

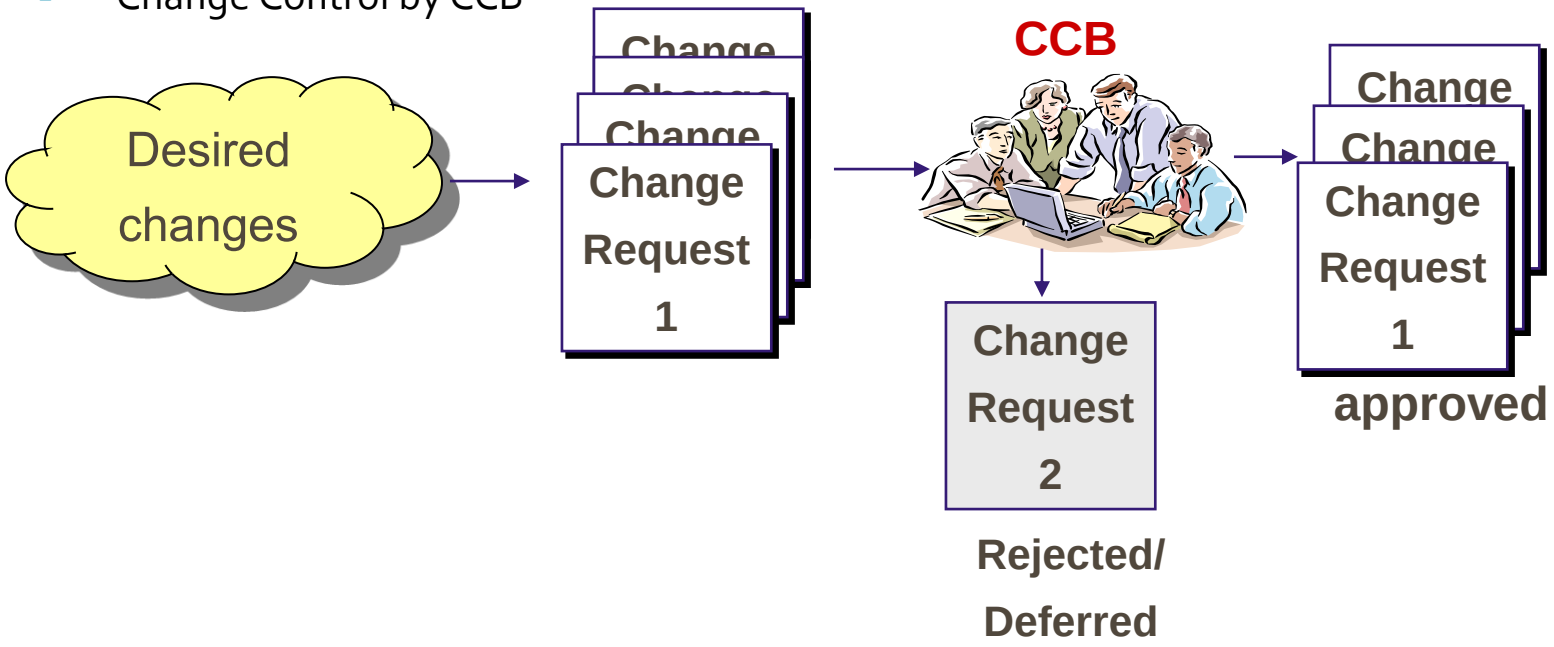
Baseline
- A stake in the ground
- Official version
- Formally documented, reviewed and approved
- Only authorized changes allowed
- Basis for all development work



  - define and perform change management process
  - All plan and work products are updated
  - Use Traceability Matrix to identify updated

Requirement Engineering Process

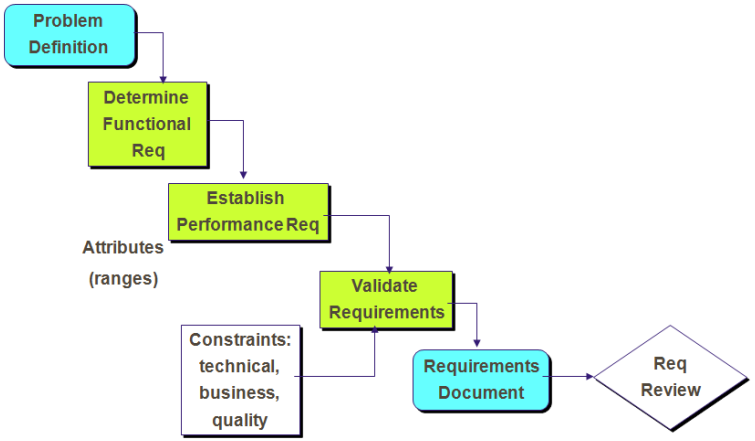
- Manage Requirements
  - Change Control by CCB



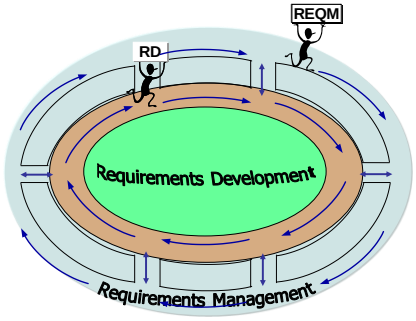
- Requests for change are formally submitted
- Changes are authorized by a Change Control Board
- **CCB:** 베이스라인 설정된 형상항목의 변경에 대하여 변경 영향평가 후 변경 승인/기각을 결정하는 심의 조직

Requirement Engineering Process

- Requirement Engineering의 범위
  - Requirement Development (RD)
    - Develop Customer Requirement
    - Develop Product Requirement
    - Analyze and Validate Requirement



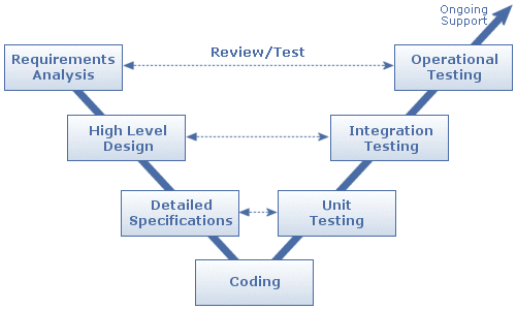
  - Requirement Management (REQM)
    - Obtain an Understanding of Requirements
    - Obtain Commitment to Requirements
    - Manage Requirements Changes
    - Maintain Bidirectional Traceability of Requirements
    - Identify Inconsistencies between Project Work and Requirements

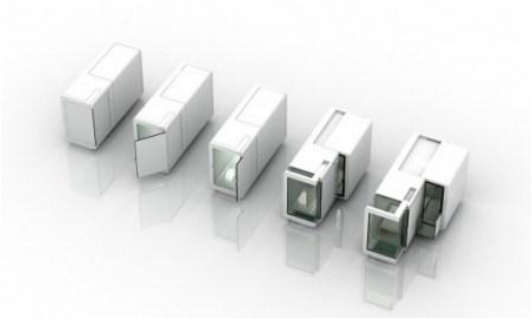


2D Extension

- Idea (System Extension)
  - ERP → SCM, PDM → PLM

- 2D Extension
  - Horizontal Extension
    - Lifecycle 전반으로의 확장
  - Vertical Extension
    - Product Line으로의 확장
      (Reuse, VM, etc)





2D Extension

- 1st Step
  - S/W Requirements, Test Case
  - Change Management
- 2nd Step
  - Requirements Standardization

    : Standardization(Upstream Requirements, SRS, T/C), Prevention, Globalization, etc
- 3rd Step
  - Process Optimization

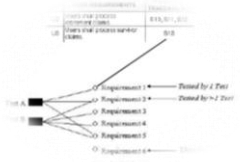
    : Integration, Automation, etc

2D Extension

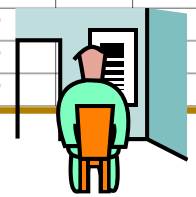
- 1st Step
  - S/W Requirements - Test Case, Change Management , etc

[SRS]
-Overview
. Context Diagram
. Constraint
-Functional Req.
. Function#1 ~ n
(Use Case Describe)
-Quality Attribute
(Scenario)
-Interface Req.
(Ext./Int. Interface)
- Reference
(Standard, Spec,. etc)

Good Requirements are
correct
unambiguous
complete
consistent
ranked for importance and/or stability
verifiable
modifiable
traceable



T/C ID	Feature (SRS ID)	Environmental Condition	Input	Test Procedure (Steps)	Expected Output	Result	Actual output	Remarks
ID	사양	수행 조건 (SRS의 Pre-condition과 유사)	별도로 정의할 수 있는 투입물?	수행절차 (나중에 문제점 발생 시 재현 절차로 활용)	예상결과	PASS, FAIL, Block 등 수행결과 판정	FAIL 실제 결과 작성	기타 특이 사항 및 Comments



[Change Request]
Phase, Submit Part, Reason

S/W Release

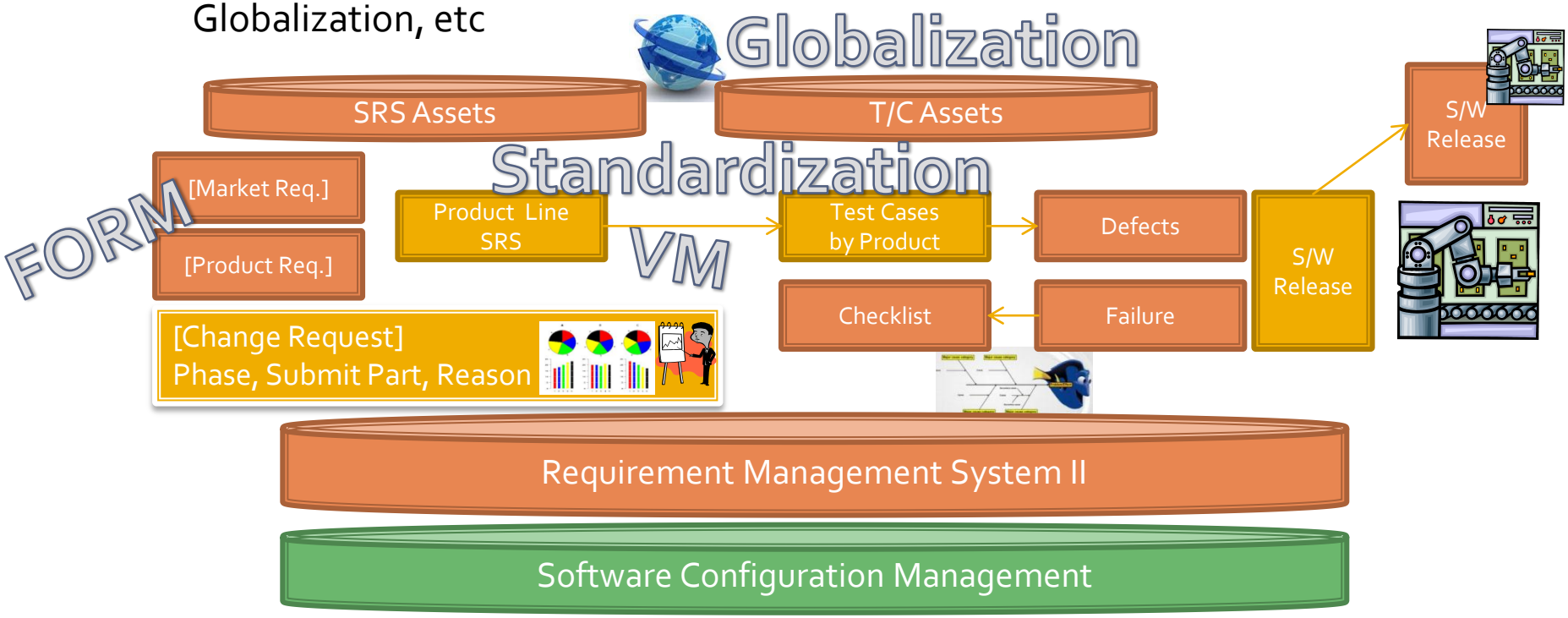
Requirement Management System I

Software Configuration Management

2D Extension

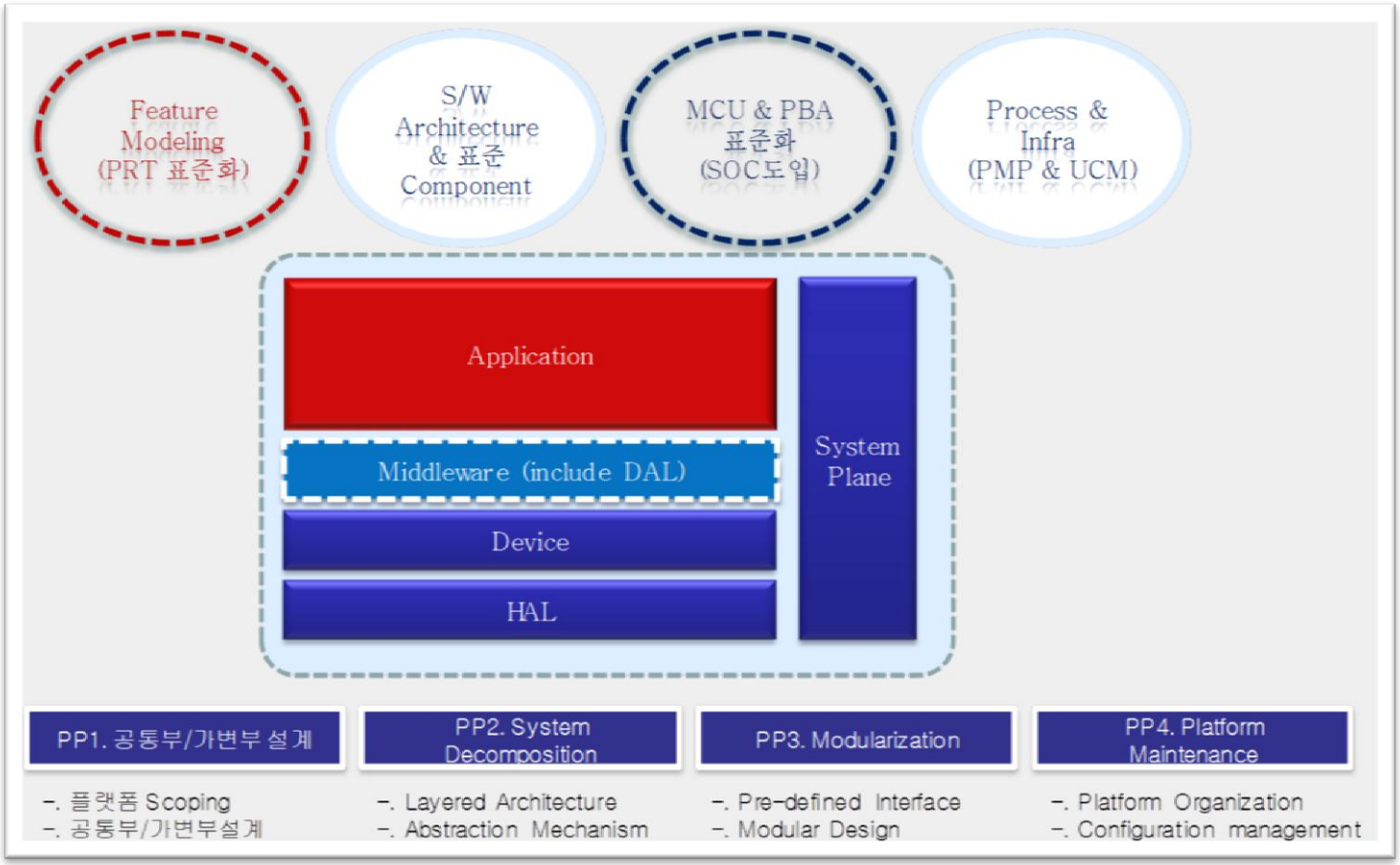
- 1st - 2nd Step
  - Requirements Standardization

    :Standardization(Upstream Requirements, SRS, T/C), Prevention, Globalization, etc



2D Extension

- 1st - 2nd Step (Platform기반의 상품화 개발)

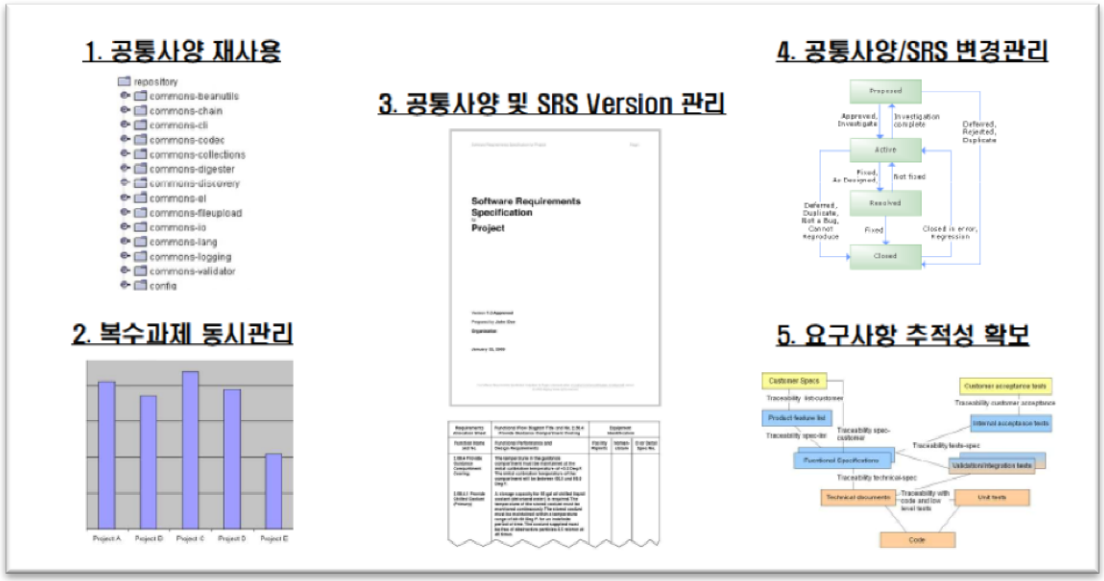


2D Extension

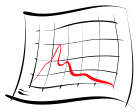
- 1st – 2nd - 3rd Step
  - Process Optimization
    - Document / Report 자동생성
      - S/W Test Plan, S/W Test Report, etc
      - KPI Report (Measure and Analysis)
        : 사양 적기 확정율, 단계별 변경점 현황, 표준사양-T/C 재사용율 등)
    - Alert / Notification 기능 강화
      - Task 수행 또는 지연 알림 (PRT 미작성 / 확정)
      - 시장문제점 등록 PL급 실시간 공유
    - 개발+양산간 Change Request Process 통합
    - Project Management 연계
      - Estimation 활용 (사양변경(재사용, 신규, 변경, 삭제) 범위 기반의 산정)
      - 개발 Task 및 진척율 관리 (Feature 구현율)
  - System Maintenance
    - System Performance 향상 (Database 분리 및 성능향상)
    - 신규기능 (Manu Tree, Message 표준화) 적용

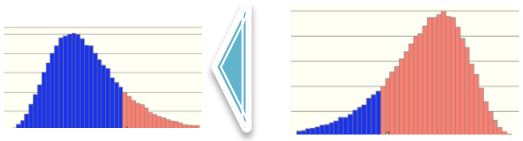
Wrap up

- 제품개발에 적합한 효율적인 요구관리



- Benefits of the extension of RM System
  - 재사용 및 시스템 도입/확장을 통한 품질 및 생산성 향상
    : 사양표준화 및 군사양 정의를 통한 공통, 가변부 정의, 차이분석 가시화 / 명확화
  - **사양변경 감소 및 Left-shift**
  - **단계별 결함 감소**

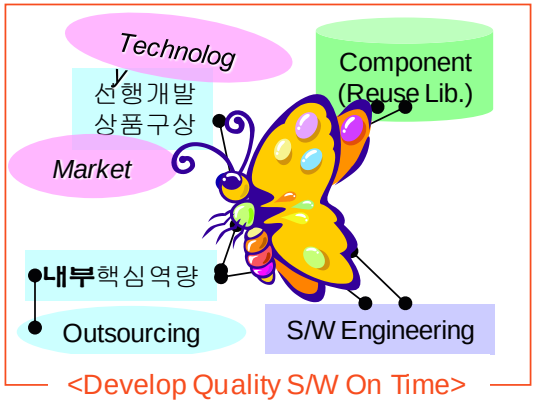




Q&A

- How to get commitment for Investment?
- How to attract and engage users with the system?
- How to ensure sound requirements?
- How to manage SRS with IA?
- Is “TBD” needed?
- Others…

감사합니다.



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