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TIMBUS
TIMELESS BUSINESS PROCESSES AND SERVICES

Requirements Analysis

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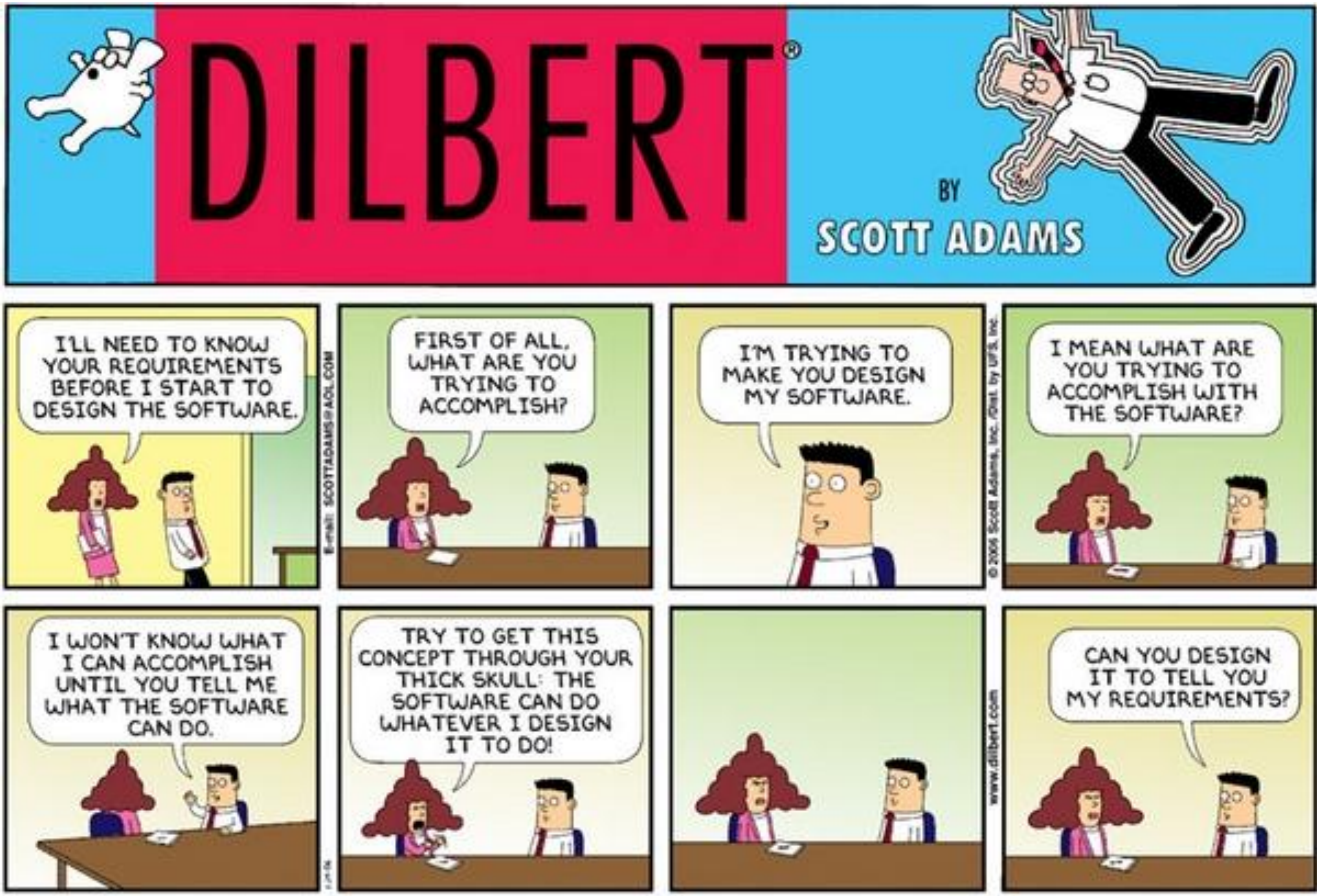
Digital Preservation Coalition

DPC Briefing Day, 13 December 2013


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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AQR16	Acquire [Highly Desirable]	Must handle ingest of digital material where the smallest level of granularity in the submission is larger than the DOM System level of ingest granularity (article). e.g. a journal issue is one PDF with several articles in it	RDR5
AQR17	Acquire [Highly Desirable]	The system must keep and generate reports on failed and unsolicited submissions.	
AQR18	Acquire [Highly Desirable]	Must notify information provider of satisfactory transfer of data, if this is required in the information provider profile. In FTP pull scenarios providers may require return notification of satisfactory transfer of data to allow them to manage disk space on their ftp site.	

4.12 Pre-Ingest Module Requirements

Num	Category	Requirement	X-Ref
PIR1	Pre-Ingest [Highly Desirable]	Must support batch submission to the pre-ingest module.	
PIR2	Pre-Ingest [Highly Desirable]	Must support manual resubmission to the pre-ingest module in case of manual intervention.	
PIR3	Pre-Ingest [Highly Desirable]	Must construct ingest list of successfully acquired submissions and schedule batch processing.	
PIR4	Pre-Ingest [Highly Desirable]	Must create new object instances for every physical and logical object in the traversal of the submission.	

When

- For software system specification
- For any specification
- For Digital Preservation or any other domain
- For in-house development, tender, COTS
  - Separate but related decision – what vs. how

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What for

- Identify needed attributes, functions, characteristics, quality
- To achieve value for stakeholders
- Based on business needs
- Guided by policies

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Why

- Understand the system
- Communicate the function of the system
- Identify conflicting interests

Reduce the development effort

Why

- Understand the system
- Communicate the function of the system
- Identify conflicting interests
- **Measure tendering proposals against it**

Customer-supplier agreement: what the software product is to do

Provide a basis for estimating costs and schedules.

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Why

- Understand the system
- Communicate the function of the system
- Identify conflicting interests
- Measure tendering proposals against it
- **Feed into the design stage of product development**

Also:
- *Facilitate transfer.*
- *Serve as a basis for enhancement.*

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Why

- Understand the system
- Communicate the function of the system
- Identify conflicting interests
- Measure tendering proposals against it
- Feed into the design stage of product development
- **Test software against it**

Provide a baseline for validation and verification

Use determines form

Requirement as **basis for tendering**
- must not exclude credible options
- must be open
- **-> high-level** abstract statement

Requirement as **basis for the software contract and for testing**
- must define detail
- **-> detailed** specification

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What

Business Requirements	Goals, objectives, needs, opportunities, problems	High level	Business perspective: ***what must be accomplished***
User Requirements	Functionality provided to the user; user interaction with the system	Mid level	
System Requirements	How to integrate with existing system components, platforms, interfaces	Higher level	Solution perspective: ***what the solution must be able to do*** ***how well it must perform***
Functional Requirements	system services or functions; capabilities; behaviour;	Lower level	
Non-functional requirements	constraints on the system or on the development process: quality of service, performance, reliability, testability	Lower level	

Requirement properties

- Specific
  - **Cohesive: one issue**

Too much: ✗

The system must generate reports and performance metrics.

Requirement properties

- Specific
  - Cohesive: one issue
  - **Complete: fully stated**

Specify the responses to both valid and invalid input values!

Too little:
The system must generate reports. ✗

Requirement properties

- Specific
  - Cohesive: one issue
  - Complete: fully stated
  - Correct
- Measurable
  - **Testable**

The system must generate *attractive* reports in *a timely manner* ✗

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Requirement properties

- Specific
  - Cohesive: one issue
  - Complete: fully stated
  - Correct
- Measurable
  - Testable
  - **Defined terms**

The system must generate HSTQ-style reports ✗

Requirement properties

- Specific
  - Cohesive: one issue
  - Complete: fully stated
  - Correct
- Measurable
  - Testable
  - Defined terms
- **Attainable**

Reports on unsolicited submissions must be available at all sites as soon as they occur. ✗

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Requirement properties

- Specific
  - Cohesive: one issue
  - Complete: fully stated
  - Correct
- Measurable
  - Testable
  - Defined terms
- Attainable
- **Relevant**
  - Traceable to a business need

The system must generate reports on the publishers' business growth ✗

Requirement properties

- Specific
  - Cohesive: one issue
  - Complete: fully stated
  - Correct
- Measurable
  - Testable
  - Defined terms
- Attainable
- Relevant
  - Traceable to a business need
- **Time Bound**

The system must generate daily reports on unsolicited submissions. ✓

Requirement properties

- Specific
  - Cohesive: one issue
  - Complete: fully stated
  - Correct
- Measurable
  - Testable
  - Defined terms
- Attainable
- Relevant
  - Traceable to a business need
- Time Bound
- **Implementation neutral**

The system must generate reports on unsolicited submissions as *relational database tables.* / The system must *email* reports on unsolicited submissions to the head of department. ✗

Requirement properties

SMART

- Specific
  - Cohesive: one issue
  - Complete: fully stated
  - Correct
- Measurable
  - Testable
  - Defined terms
- Attainable
- Relevant
  - Traceable to a business need
- Time Bound
- **Implementation neutral**

The system must generate reports on unsolicited submissions as *relational database tables.* / The system must *email* reports on unsolicited submissions to the head of department. ✗

Identify stakeholders

- People affected by the system, who
  - Operate the system
  - Benefit from functionality, politically, financially, socially
  - Involved in procuring the system
  - Regulators (legal, health & safety)
  - Responsible for the system
  - Outside the organization, who are affected
  - Who oppose it

Elicit requirements: stakeholders

- Identify needs
  - Interviews with individuals
    - Detailed specifications
    - Uninfluenced perspectives
  - Focus groups, requirements workshops
  - Document analysis, …
  - Later:
    - Requirements prioritization
    - Requirements review

Elicit requirements: stakeholders

- Identify needs
  - Interviews with individuals
    - Detailed specifications
    - Uninfluenced perspectives
  - Focus groups, requirements workshops
  - Document analysis, …
  - Later:
    - Requirements prioritization
    - Requirements review
- Prototype
  - Involve stakeholders early
  - Improve ones understanding
  - Manage expectations
- Storyboards
  - Screen sequences illustrate steps in user experience

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Elicit requirements: stakeholders

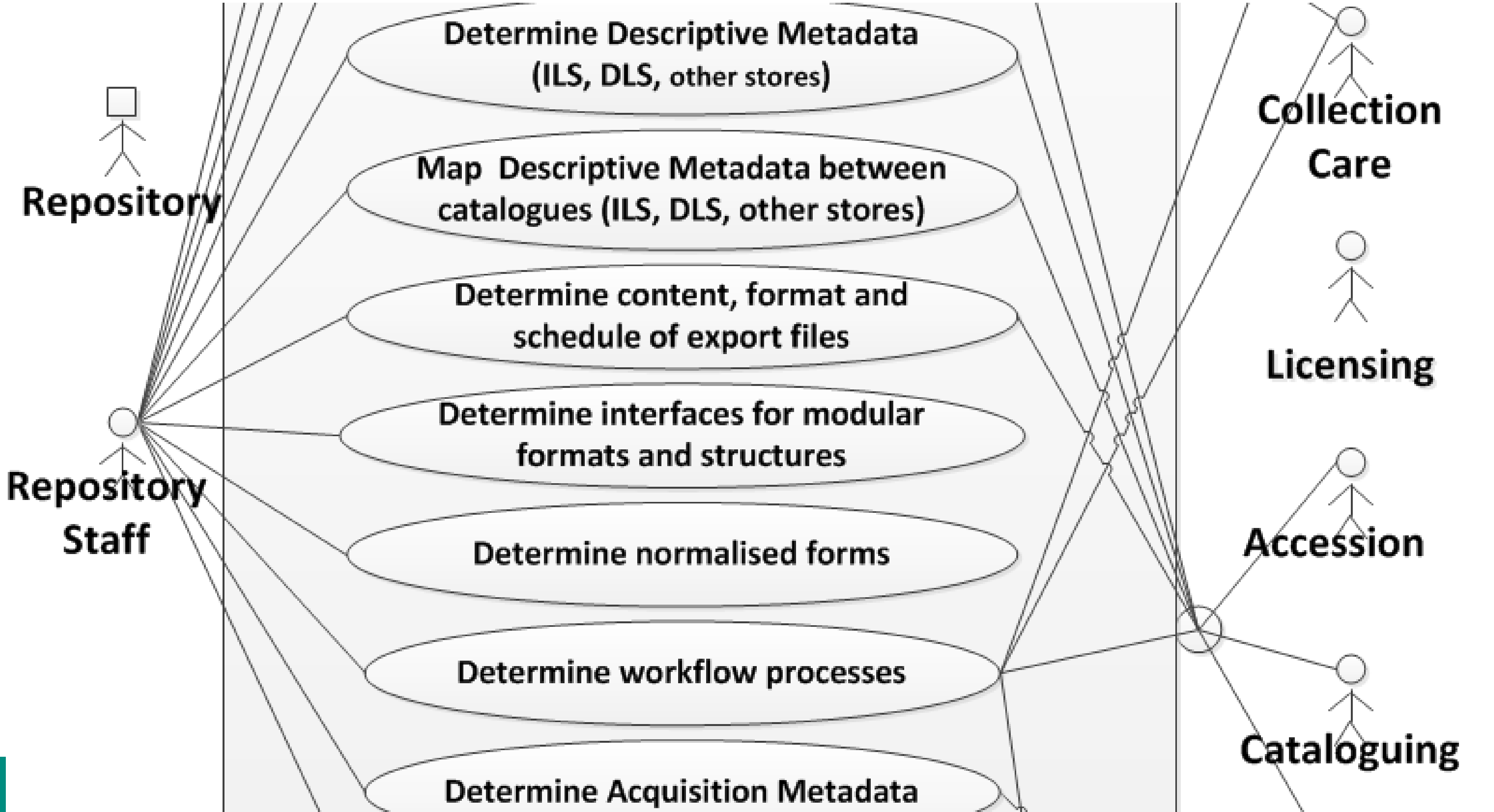
- Change management to ensure system acceptance and fit-for-purpose
  - Stakeholders must see the benefit of the change
  - Stakeholders must own the system
  - Stakeholders must be trained effectively

A SUCCESSFUL TRANSFORMATION REQUIRES EMPLOYEES TO FEEL OWNERSHIP FOR THE CHANGE.
CHANGE
DilbertCartoonist@gmail.com

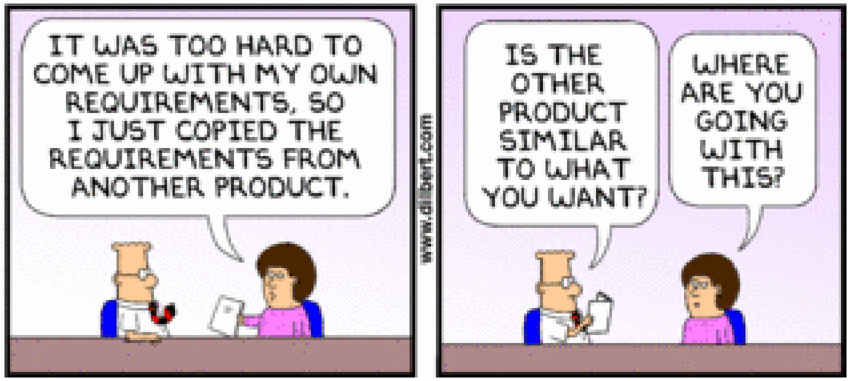
Elicit requirements: processes

- Identify business processes
  - Work place observation
  - How stakeholders interact with the system
  - Technological change leads to business change

Elicit req's: use cases & scenarios


Repository
Repository Staff
Determine Descriptive Metadata (ILS, DLS, other stores)
Map Descriptive Metadata between catalogues (ILS, DLS, other stores)
Determine content, format and schedule of export files
Determine interfaces for modular formats and structures
Determine normalised forms
Determine workflow processes
Determine Acquisition Metadata
Collection Care
Licensing
Accession
Cataloguing

Elicit requirements: frameworks


IT WAS TOO HARD TO COME UP WITH MY OWN REQUIREMENTS, SO I JUST COPIED THE REQUIREMENTS FROM ANOTHER PRODUCT.
www.dilbert.com
IS THE OTHER PRODUCT SIMILAR TO WHAT YOU WANT?
WHERE ARE YOU GOING WITH THIS?

- Other organizations' requirements documents
- Software vendor's specifications
- Strategy and policy documents
- OAIS – Open Archival Information System
- TRAC – Trusted Digital Repository Audit and Certification
- DoD 5015.2 – Baseline requirements for records management applications
- MOREQ – Model Requirements for the Management of Electronic Records
- GARP – General Accepted Recordkeeping Principles
- SAA Glossary of Terms (http://www.archivists.org/glossary)

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Requirements sets

- Correct
- Consistent
- Complete
- Non-redundant

Requirements sets

- Correct
- Consistent
- Complete
- Non-redundant
- **Structured**

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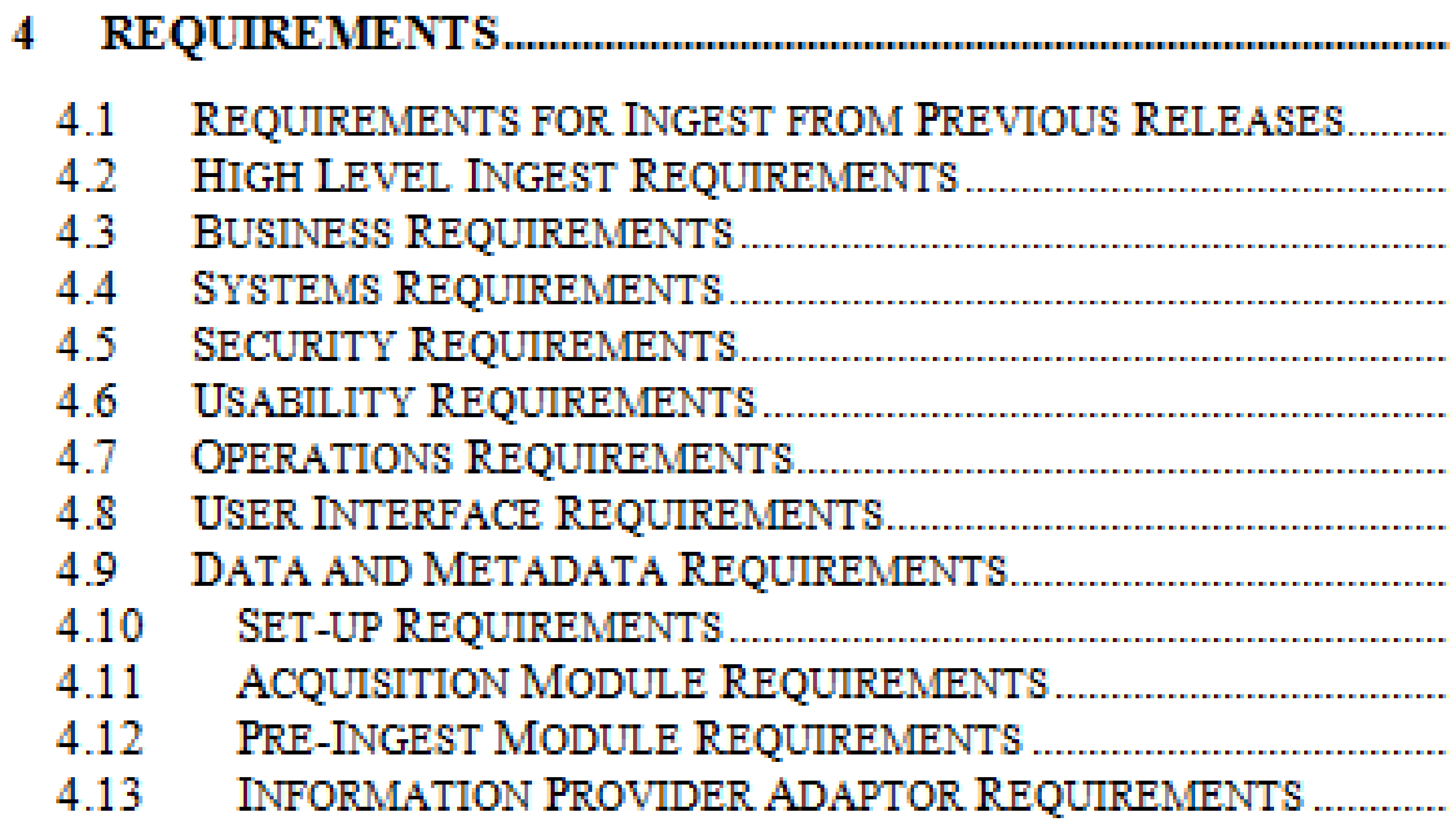
Requirements structure

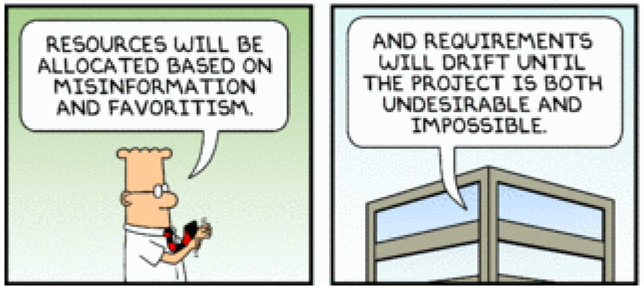


Requirements sets

- Correct
- Consistent
- Complete
- Non-redundant
- Structured
- **Prioritised**

Matching requirements to resources

- Resources are limited
- Assign a priority to each requirement
  - MoSCoW : Must Should, Could, Would be nice
- Specify what is out of scope


RESOURCES WILL BE ALLOCATED BASED ON MISINFORMATION AND FAVORITISM.
AND REQUIREMENTS WILL DRIFT UNTIL THE PROJECT IS BOTH UNDESIRABLE AND IMPOSSIBLE.

- Adopt an incremental approach
  - Start w/ core functionality
  - Add optional functionality over time
  - Learn from each increment
    - Functionality
    - Implementation
  - Adapt as necessary

Requirements sets

- Correct
- Consistent
- Complete
- Non-redundant
- Structured
- Prioritised

- **Traceable**
  - **Forward:**
    unique reference
  - **Backward:**
    source reference

Requirements sets

- Correct
- Consistent
- Complete
- Non-redundant
- Structured
- Prioritised

- Traceable
  - Forward:
    unique reference
  - Backward:
    source reference
- **Modifiable**
  - **organization**
  - **table of contents**
  - **index**
  - **cross-referencing**

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Parts of an SRS

Introduction

Purpose

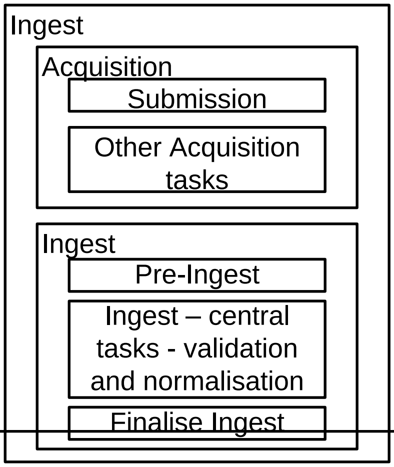
Scope: positive and negative

Definitions, acronyms, and abbreviations: for unambiguous requirements

References: for traceable requirements

Overview

Glossary

Acquisition	Acquisition is the first step in the ingest process which involves the (push or pull) submission, virus check, and unpacking of archival and compressed files. In library terms it corresponds to the acquisition and accession tasks.
Acquisition Method	The Acquisition Method specifies the technical details needed to perform a successful acquisition. Considerations include the transport mechanism (e.g., FTP, SSH), control (pull or push), authentication (certificates, user names, passwords).
Ingest  Ingest Acquisition Submission Other Acquisition tasks Ingest Pre-Ingest Ingest – central tasks - validation and normalisation Finalise Ingest	The term Ingest is currently used in three ways in this and related documents: a. The overarching term for the whole process of ingesting digital materials, comprising submission, acquisition, and so on. b. The step in the ingest process which follows successful 'acquisition'. c. The core 'ingest' tasks such as validation, normalisation, and creating DSIPs for digital objects in a submission. In this usage, it may be preceded by 'pre-ingest' and followed by 'finalise ingest' tasks.

Parts of an SRS

Overall description

- Objectives
- Model
- Business Process
- Product functions
- Constraints
- Assumptions and dependencies
- User Roles and Responsibilities
- User characteristics
- Interactions with Other Systems
- Replacement of Legacy Systems
- Production Rollout Considerations

Parts of an SRS

Specific Requirements

Functionality
- Security
- Auditing
- Administration / Customization of the Application
- Reporting

Performance

Usability

External interface requirements
- User interfaces
- Hardware interfaces
- Software interfaces
- Communications interfaces

Concurrency

Design

Software system attributes

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Parts of an SRS

Supporting Information

- Table of contents
- Index
- Appendices

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Requirements sets

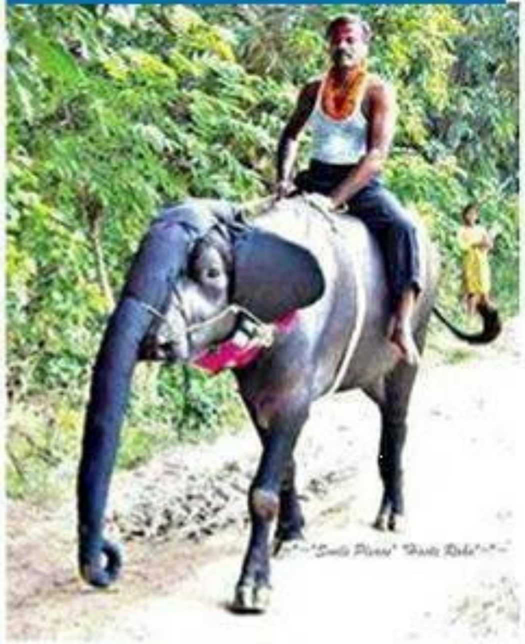
- Correct
- Consistent
- Complete
- Non-redundant
- Structured
- Prioritised

- Traceable
    - Forward: unique reference
    - Backward: source reference
- Modifiable
    - organization
    - table of contents
    - index
    - cross-referencing

Customer requirement

1. Have one trunk
2. Have four legs
3. Should carry load both passenger & cargo
4. Black in color
5. Should be herbivorous

Our Solution



1. Have one trunk ☑
2. Have four legs ☑
3. Should carry load both passenger & cargo ☑
4. Black in color ☑
5. Should be herbivorous ☑

Our Value add:

Also gives milk ☺