



Speeding up the Document Generation Process: A Case Study at a Healthcare Company

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The IBM Technical Summit



Company and business challenges

Industry: Health care

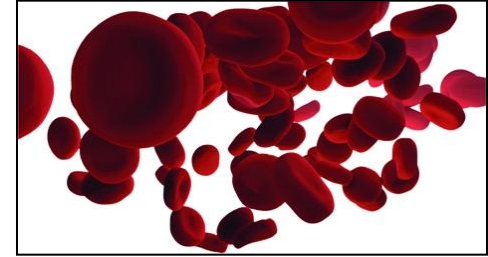
Produces: Medical Devices

Overview

- They were using a complex requirements management, modeling and testing system. For each of these systems they were using different document generation solutions.
- They wanted to improve their production system, and to integrate a web based solution to automate the document generation process inside the company.
- They were also looking to automate the production of their manuals that was done at that time completely manual with a huge effort.

Business Challenges

- Improve efficiency / reduce costs.
- Better utilization of resources. Increase employee productivity.
- Better quality of the documentation.
- Achieve and demonstrate compliance to standards.
- Management of multiple versions of products for different markets and opportunities.





Case Study

Business Needs

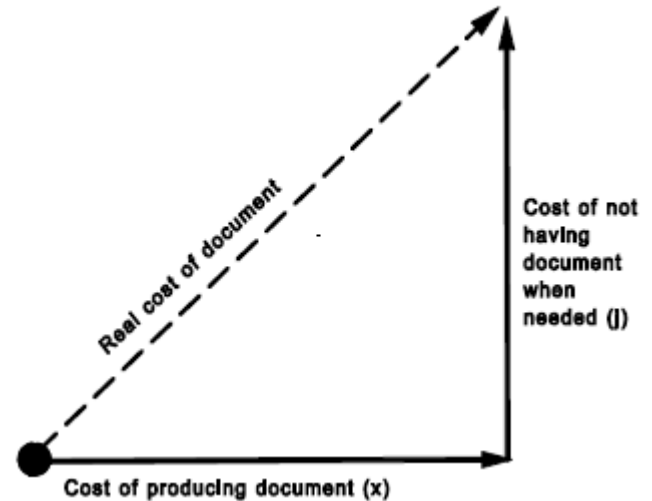
- Completely automated reporting/document generation process.
 - Capability to produce documentation directly from source system with minimal impact on performance
- Simplify the document generation process.
- Demonstrates compliance in minutes with automated report generation rather than the weeks required with manual processes.
 - Reduce or eliminate opportunities for errors
- Plan document generation in advanced (scheduler).
- Standardize the documentation style.

Solution

- Well integrated and automated document generation system based on GEBS Reporting Web Publisher, IBM Rational DOORS and IBM Rational Publishing Engine.

The cost of a document

- The documentation process occurs in every element of the SDLC.
- The costs of producing the document:
 - The production costs
 - The costs of using the document
 - The costs of not having the document when it is needed
- Reducing the costs of writing technical documentation means:
 - More documents can be produced for a given budget, i.e. documents which otherwise would not be produced now can be
 - The cost to produce the required system documents will be less, resulting in lower costs for their part of the SDLC



The real cost of producing a document

Joe Kasser: *IMPROVING THE SYSTEMS
ENGINEERING DOCUMENTATION
PRODUCTION PROCESS*

Multi tool and multi platform Development Enviroment

Rational Tools Environment

Rhapsody

Use modeling to validate requirements, architecture and design throughout the development process

DOORS

Business need elaboration
Requirements collaboration
Acceptance criteria definition

Quality Manager

Acceptance test planning and execution
Detailed metrics

ClearQuest

Change and defect tracking

ClearCase

Version control
Workspace management

Environment Infrastructure

Windows Client

DOORS
Rhapsody
ClearQuest

Linux Client

Rhapsody
ClearQuest
Home grown test tool

WEB Client

ClearQuest Web
RQM

Windows Server 2003

ClearQuest
ClearCase
DOORS
JFS
RQM

Legacy Documentation Lifecycle – SDLC Group

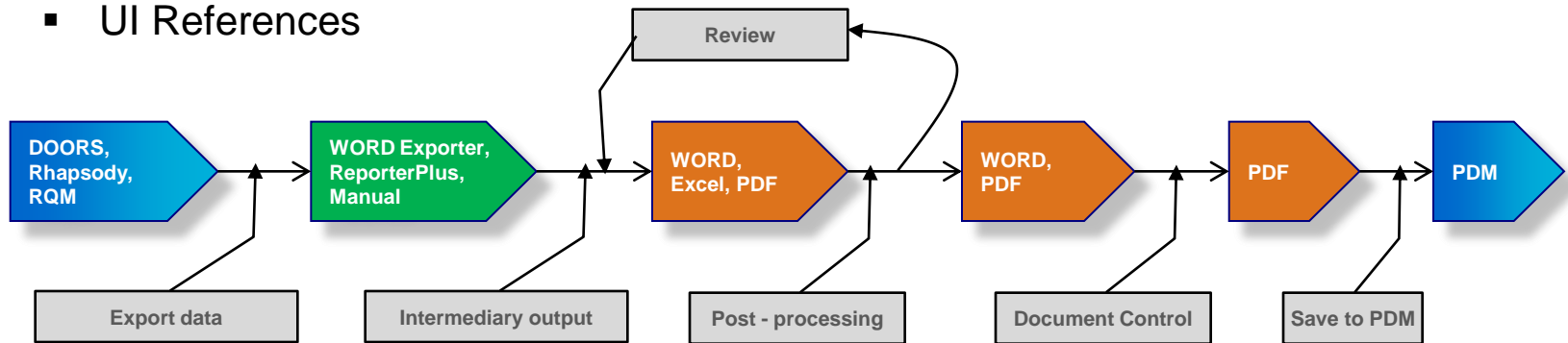
System Development Lifecycle

Requirements Documents

- FMEA
- SyRS
- URS
- UI References

Test Documents

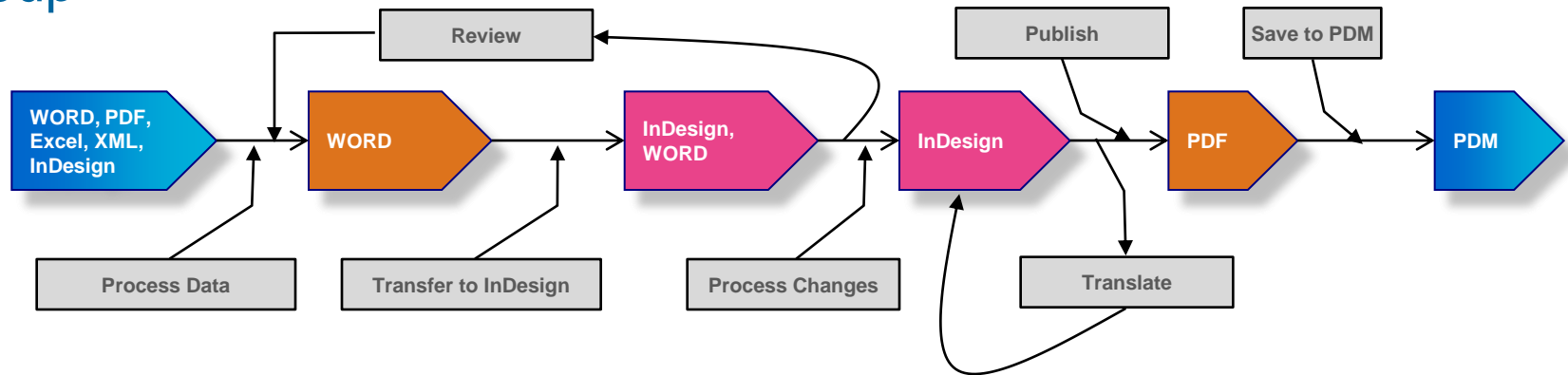
- RTM
- Test Plan



▪ Challenges included:

- Very simple reports. Only the DOORS Word Export functionality was used.
- No automation
- No document change control
- No standardization
- Manual post processing for complex documents.
- Higher costs due to multiple review/approval cycles
- Low satisfaction by authors/leads

Legacy Documentation Lifecycle – Technical Writers Group



▪ Copy Labels

- Administrator Guide
- Operator's Manual

▪ Challenges included:

- No standard: different layout for each manual. The need to create a standard layout for each type of manual.
- No repository for data. Manual content is stored in different formats: WORD, Image Files, PDF, Excel, XML
- Very slow process and very high cost
- Translations
- No navigation capabilities for PDF (hyperlinks were not supported)
- Generating ToC, ToT and ToF – manual process
- No change control

Automating the documentation generation process

- Two different types of documents
 - Copy Labels (Manuals)
 - System Engineering Lifecycle Documents (Requirements, Testing, Modeling)
- Automated reporting system through IBM Rational Publishing Engine and GEBS Reporting Web Publisher
- Online solution
- Push-button document generation
- Documents repository
- Out of the box templates
- DOORS customization for reporting
- Redesign the generation process for Manuals.



GEBS Reporting Solution

IBM Rational Publishing Engine

- Document Creation Made Simple
- High Quality, Compliant Documents
- High Performance Document Generation

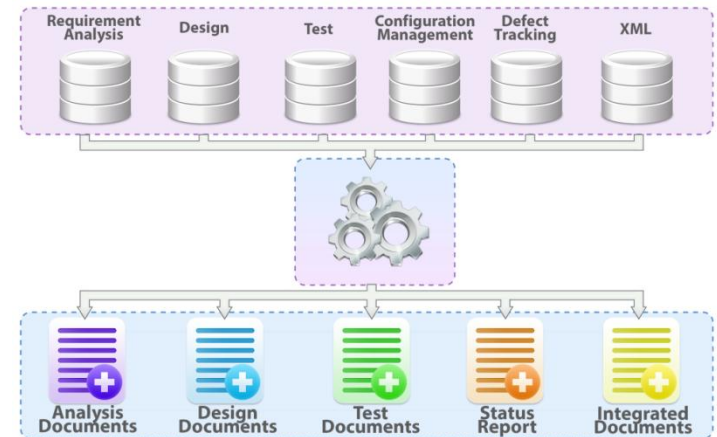


GEBS Reporting Web Publisher

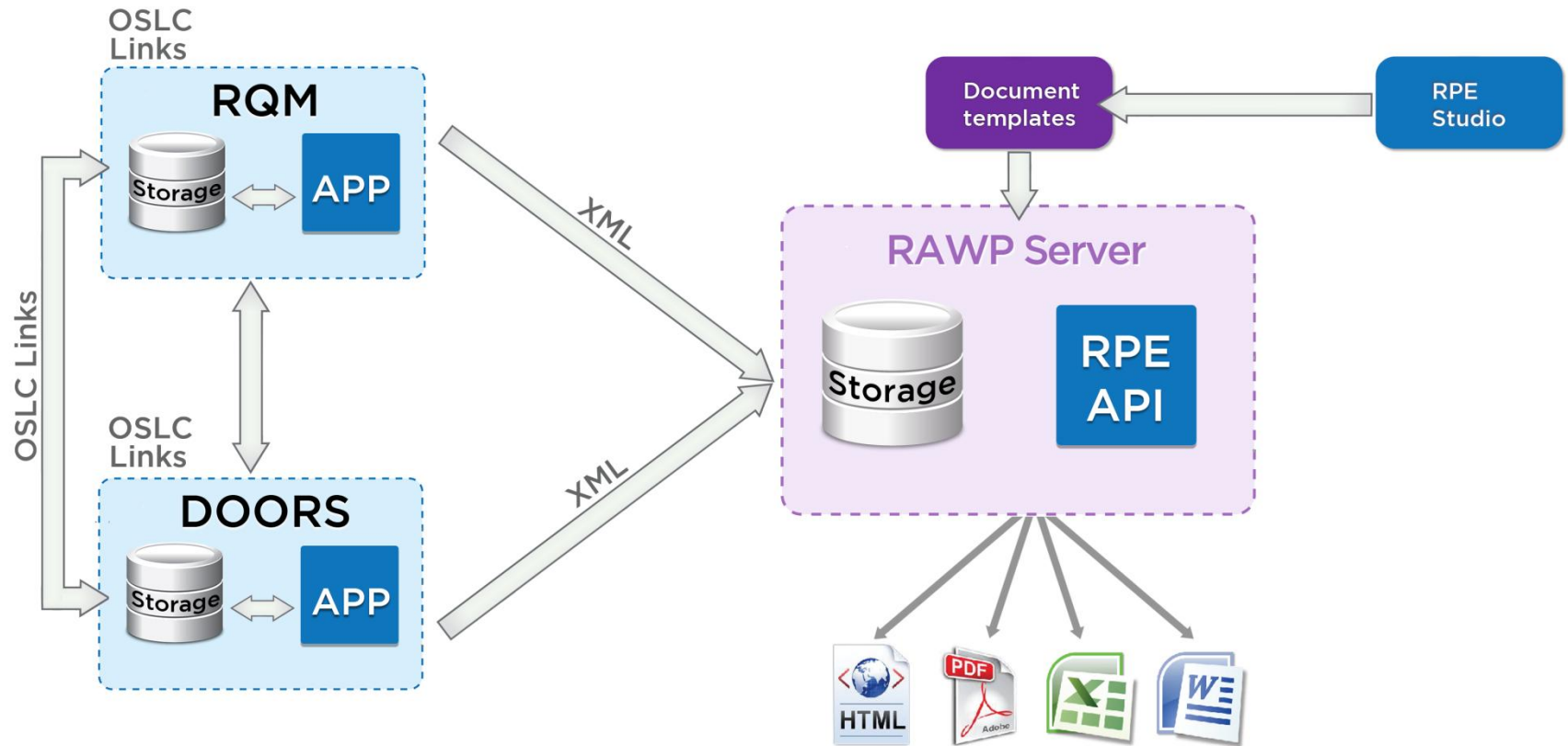
- Provides an online interface for generating documents using RPE.
- With RAWP all RPE assets can be shared to be used by other users.
- Unifies the document generation process for all teams
- Deployment is done fast and easy, with no installation required on client machine, just a web browser is needed

Supported Integrations:

- DOORS, RequisitePro, Requirements Composer, Quality Manager
- Team Concert, ClearCase/ClearQuest
- Rhapsody, System Architect, Design Manager, Focal Point, ...



GEBS Reporting Solution – Components Overview



Project Implementation Phases

■ Phase 1

- Requirements analysis (two weeks on client site)

■ Phase 2

- PoC
- Installation & Configuration

■ Phase 3

- Template Design for SE
- DOORS Implementation
- DOORS Customization

■ Phase 4

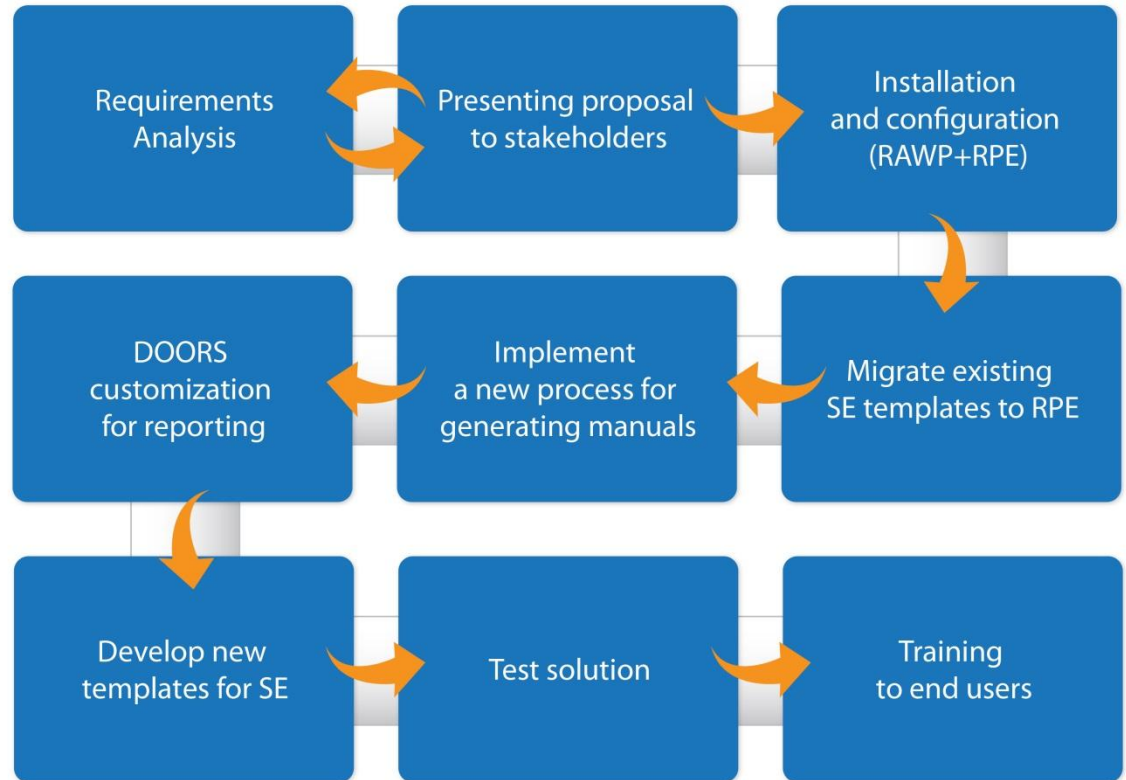
- Template Design for Manuals
- Advanced templates for SE
- Deploy resources on server

■ Phase 5

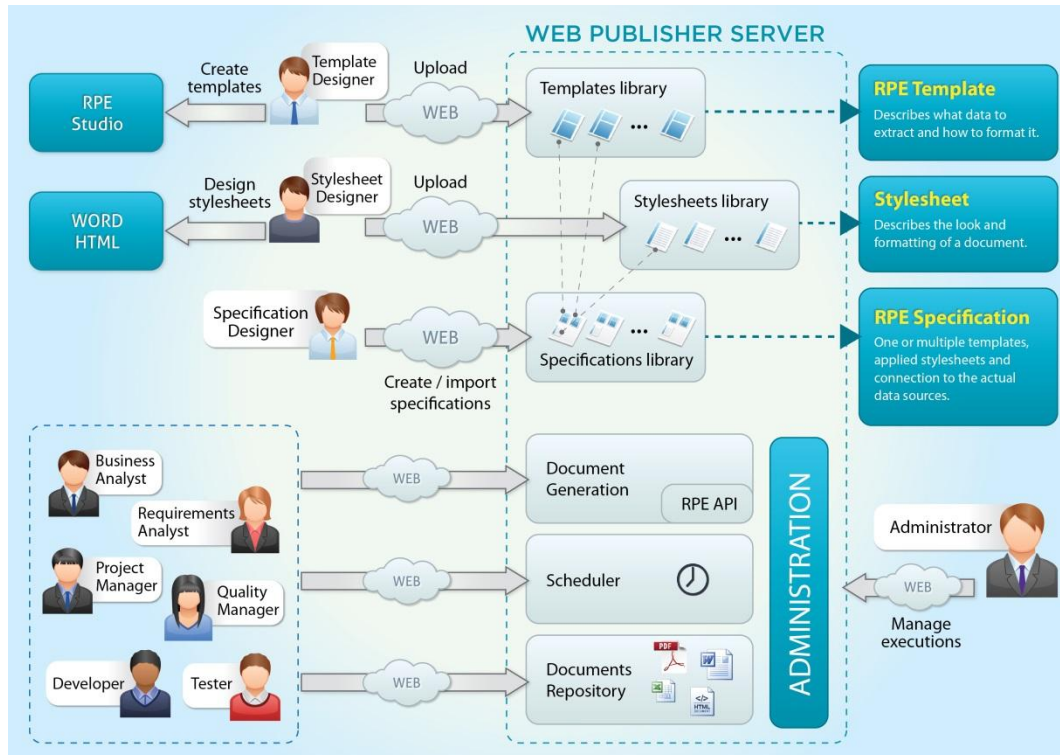
- Test Solution
- RAWP Training

■ Phase 6

- Future processes identified.
New integrations (ClearQuest, Rhapsody)



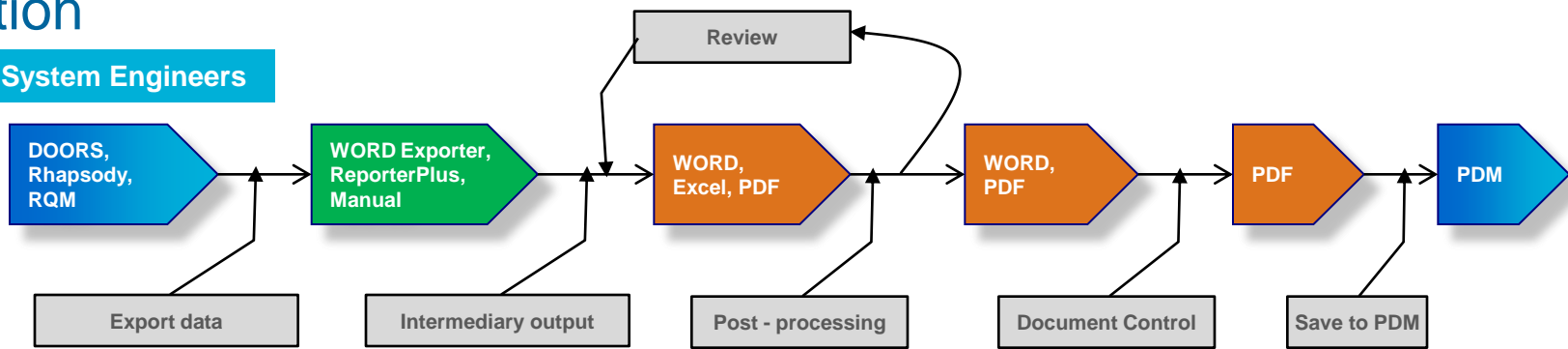
Proposed Document Generation Workflow



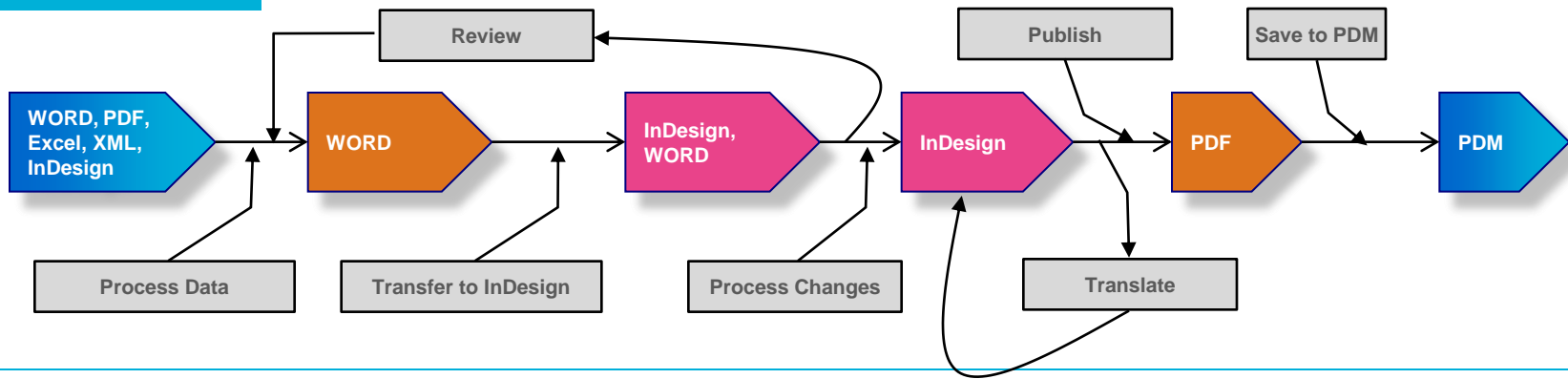
1. Analyze requirements
2. Create document templates and stylesheets
3. Authorize and share document templates and stylesheets
4. Create and configure document specifications
5. Authorize and share document specifications
6. Publish documents or schedule executions

Simplifying and standardizing with GEBS Reporting Solution

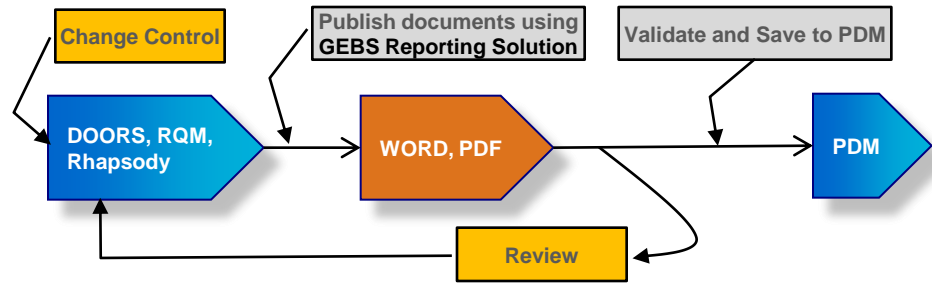
Before – System Engineers



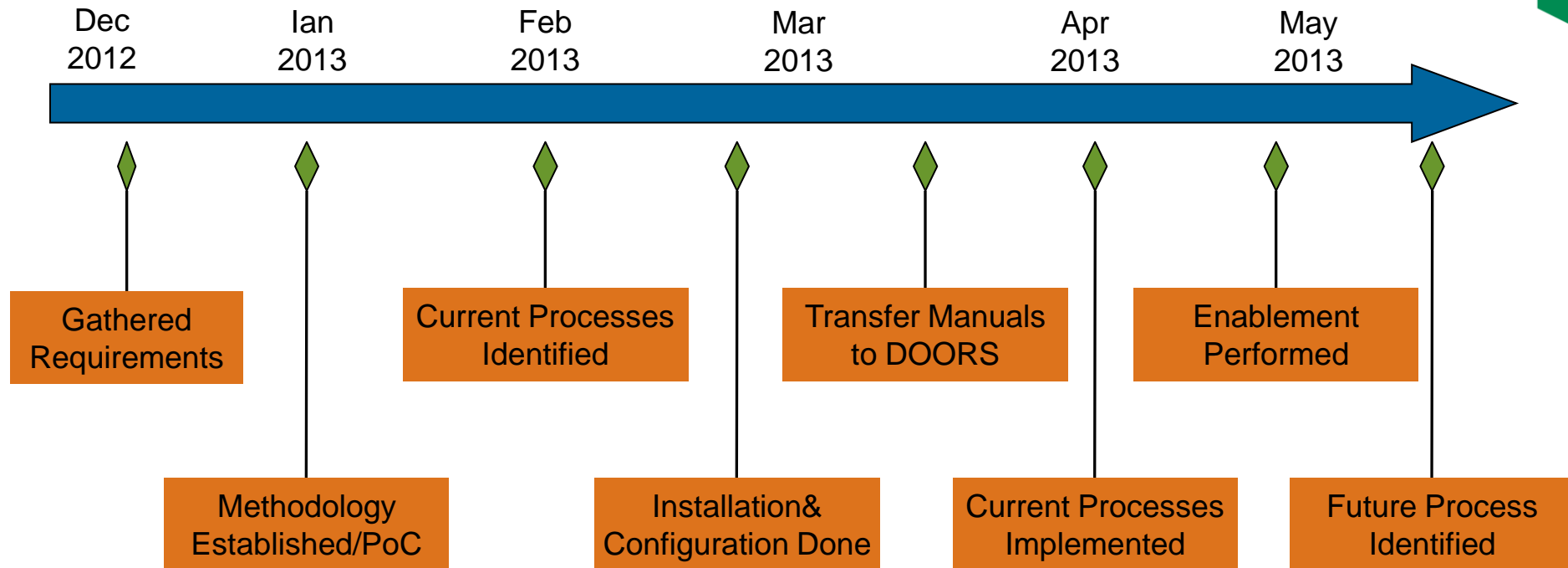
Before – Technical Writers



After – Unified Process



Project Timeline



Use best practices

- Design and template optimization
- Remove post-processing in WORD and Excel
- Provide change control through DOORS – ClearQuest integration
- Reusability of resources (collaboration)
- Standardization for document formatting – company stylesheet



Automated Process

Business Need #1

Completely automated reporting/document generation process

- Web based solution. Generate reports just using a web browser.
- Integrate smoothly in company existing environment.
- No installation required on user machine. Deployment cost down to zero. Update cost down to zero.
- Intuitive and very simple interface.
- Powerful functionality.
- Role-based permission architecture to protect client sensitive data.
- Reporting collaboration through shared libraries for templates, specifications and stylesheets.



One click solution

Business Need #2

Simplify the document generation process

- One click button solution.
- No RPE, InDesign, VBA knowledge is requested.
- Reduced the document generation process from 6 phases to 3.
- Reduced the resources involved with more than 50%.
- Real time document generation.
- Automated process, no post-processing is needed.
- No intermediary outputs. No human intervention in processing documents.

Generates composite reports

Business Need #3

Demonstrates compliance with automated report generation

Requirements Documents (DOORS)

- Failure Mode and Effect Analysis
- System Requirements Specification
- UI References

Two versions, **one** template for each document:

- review (show changes from last baseline)
- production

Next: Increase the number of reports up to 15

Verification and Validation Documents (Quality Manager)

- Requirements Traceability Matrix
- Test Plan

Systems FMEA Table

ID	State	Subsystem	System Failure Mode	Potential Effect of Failure	Hazardous Situations	Risk Controls	P1 Pre	P (None) Pre	P (Neg) Pre	P (Hw) Pre	P (Sw) Pre	P (Gt Cat) Pre	Risk Reduction Rationale
RISK_1038			PreCollection										
RISK_2626	Common PreCollection		Common PreCollection										
RISK_2614	Common PreCollection	Stop Button	Stop Button										
RISK_2638	Common PreCollection	Stop Button	Stop Button stops the system when it is not pressed.	Procedure terminated without blood loss	HSH_1041 Instrument does not function		Not analyzed	Not analyzed	Not analyzed	Not analyzed	Not analyzed	Not analyzed	
RISK_2615	Common PreCollection	Touch Screen	Touch Screen										
RISK_2973	Common PreCollection	Touch Screen	Touch Screen displays a blank screen when desired to display.	Unable to begin collection	HSH_1041 Instrument does not function		Not analyzed	Not analyzed	Not analyzed	Not analyzed	Not analyzed	Not analyzed	
RISK_2975	Common PreCollection	Touch Screen	Touch Screen displays incorrect information.	When entering procedure information, incorrect donor parameters are displayed. Incorrect ECV limit may be used.	HSH_1279 Loss >30% of absolute RBC volume		1e-6	5.3e-6	5.3e-7	5.3e-7	5.3e-7	5.3e-7	Center SOPs manage the entry of donor data. It is impractical to add controls in which the instrument would confirm the donor data.
RISK_3150	Common PreCollection	Touch Screen	Touch Screen displays incorrect information.	When entering procedure information, incorrect donor parameters are displayed. Incorrect ECV limit may be used.	HSH_1277 Loss of >15% to <=30% of absolute RBC volume (or 20 to 30% with fluid replacement)		1e-5	5.3e-6	5.3e-6	5.3e-6	5.3e-6	5.3e-6	Center SOPs manage the entry of donor data. It is impractical to add controls in which the instrument would confirm the donor data.

	multiple documents	
boldFace (note lower case first letter)	Variables internal to this document	This document
Bold Face (note the space between words)	States	936-REQ-018076
Txt_Name	Text strings	936-REQ-016661
Other_Name (where "Other" is any prefix other than Txt)	UI references	936-REQ-016662

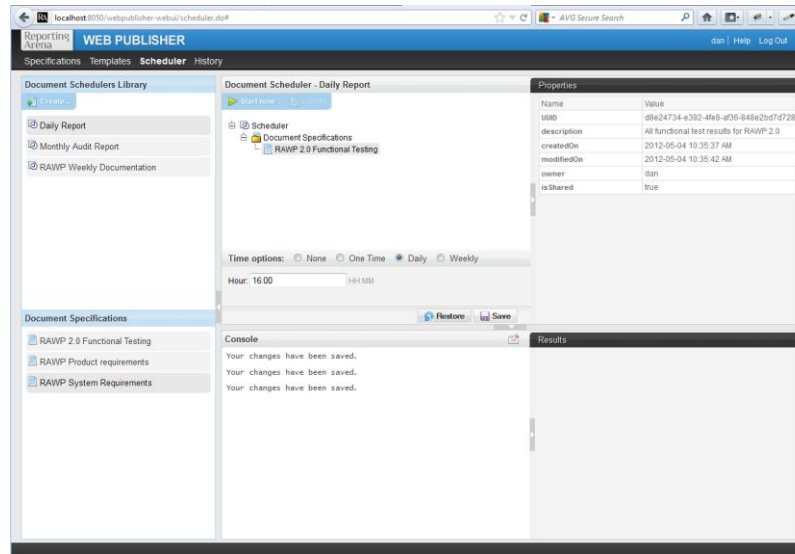
SPACD .1019	Unless otherwise specified, figures are representative, and are for reference only.	Information	
SPACD .1020	The term "state" is used to identify an array of requirements and behaviors. States may be hierarchical. In any state, requirements are to be executed in the order presented unless otherwise specified.	Information	
SPACD .1021	Overview	Heading	
SPACD .1022	Principle of Operation	Heading	

Scheduler

Business Need #4

Plan the document generation in advance. Documents repository

- All publishers are able to schedule executions over time.
- Copy labels generated every day for review.
 - Scheduled to be generated at 4 PM every day.
- Testing documents generated every Friday
- Requirements documents generated twice/week.
- All generated documents are accessible from the documents repository.





Copy labels

Business Need #5 Standardize the documentation process

- Standard layout for all SDLC documents
- Specialized layout for each type of document (Req, Test, Copy Label)
- Documents are generated based on approved & authorized templates. Increase reusability, decrease documentation inconsistency.
- 6 different output formats provided: Html, Pdf, Word, Excel, PoverPoint.

Copy Labels:

- Administrator Guide and Operator's Manual
- Content is stored in DOORS Modules. Resources are linked through DOORS Links (ex. Note text to Note Logo)
- Change control: DOORS-ClearQuest integration
- Reviews, Comments
- Decrease generation time (months - hours).



Case Study - Summary

- Automated online document generation solution
- Unify the document generation process for System Engineers and Tech. Writers
- Provide the possibility to schedule the document generations
- Very simple architecture, one click solution

Initial Costs for Reporting

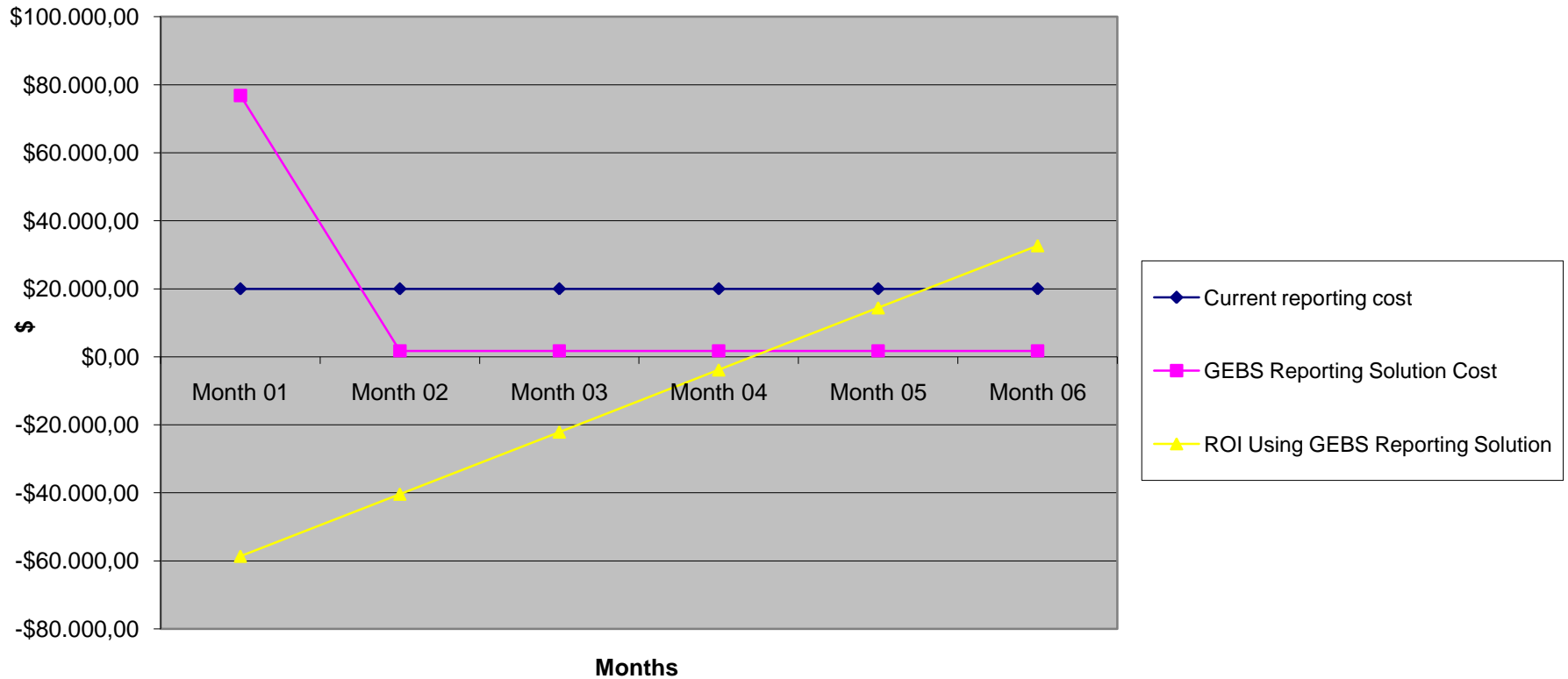
- Label Copy – Full time job – \$10,000/month
- SR, UIR, RTM, TP, FMEA – 2 hours each, once a day -> Full time job - \$10,000/month
- **Total: \$20,000/month**

Using GEBS Reporting Solution Costs

- Generate documents - 10 min x 6 reports -> 1 hour/day – \$1,250
- Administration – 1 day per month (schedule document generation, history): \$500
- **Total: \$1,750/month**

Note: Estimations were done considering an average anual cost per employee of \$120,000

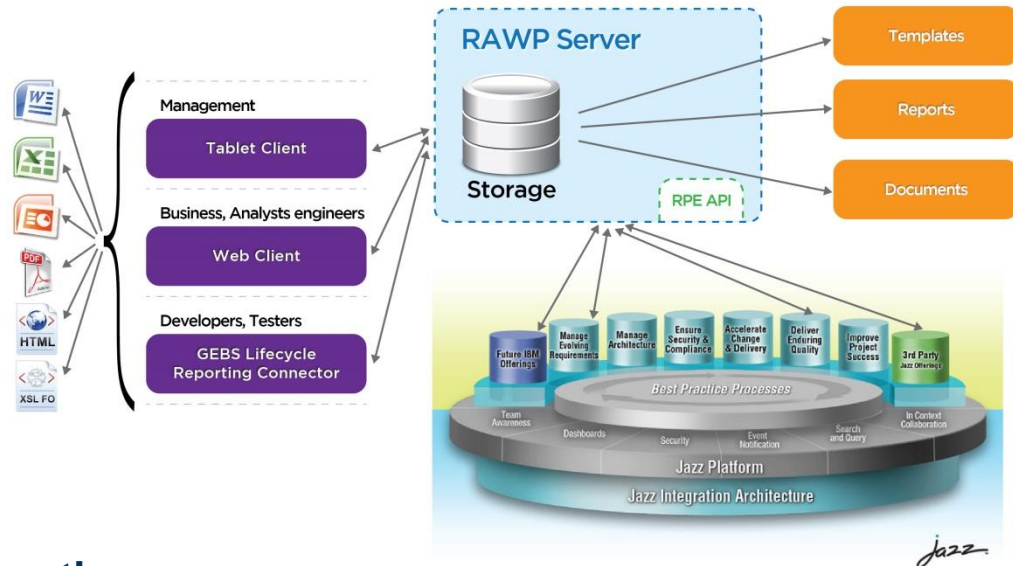
Return Of Investment



What's next

Client strategy regarding Rational:

- Move to the Jazz Platform
- Adopt Rational Team Concert for change and configuration management
- Plan to use DOORS Next in parallel with old DOORS 9.4



Futures plans for document generation

- Automate reporting process for Rhapsody/Design Manager and ClearQuest
- Increase the number of reports for R&D team (4 to 8)
- Develop 4-8 new reports for testing team.
- Increase the number of manuals (2 to 4)
- Provide document generation tablet solution for Managers

Demo

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Break

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Questions

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