

Federal GIS Conference 2014

February 10–11, 2014 | Washington DC



How to Successfully Collect, Analyze and Implement User Requirements

Gerry Clancy

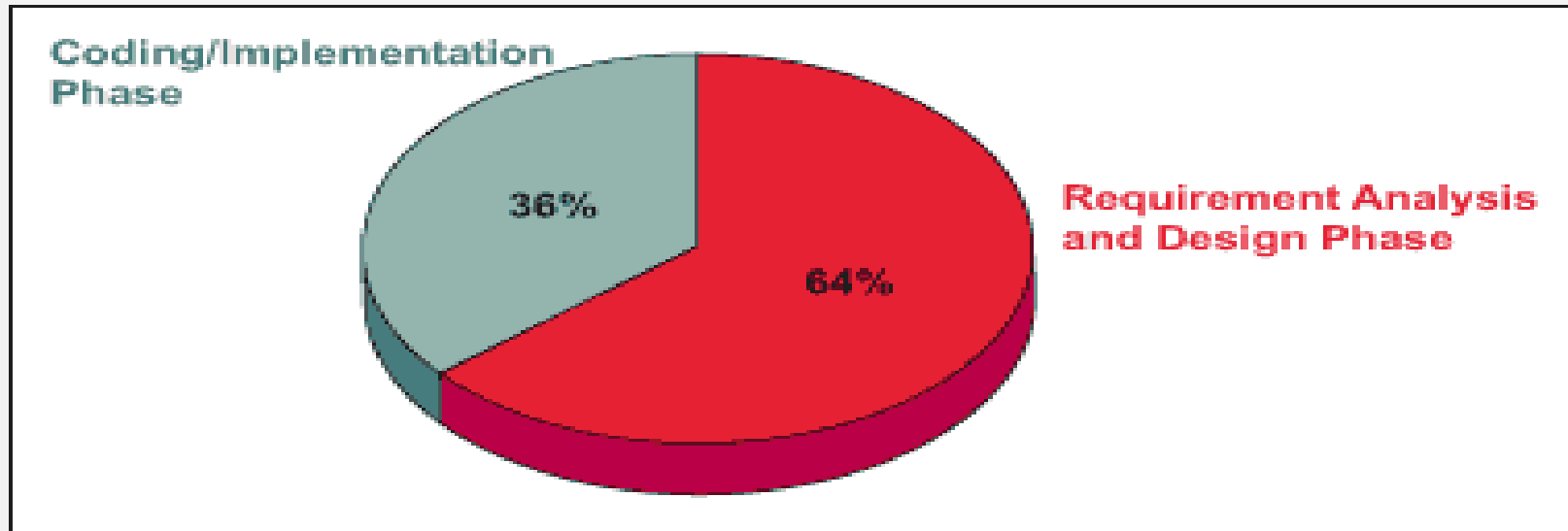
Glenn Berger



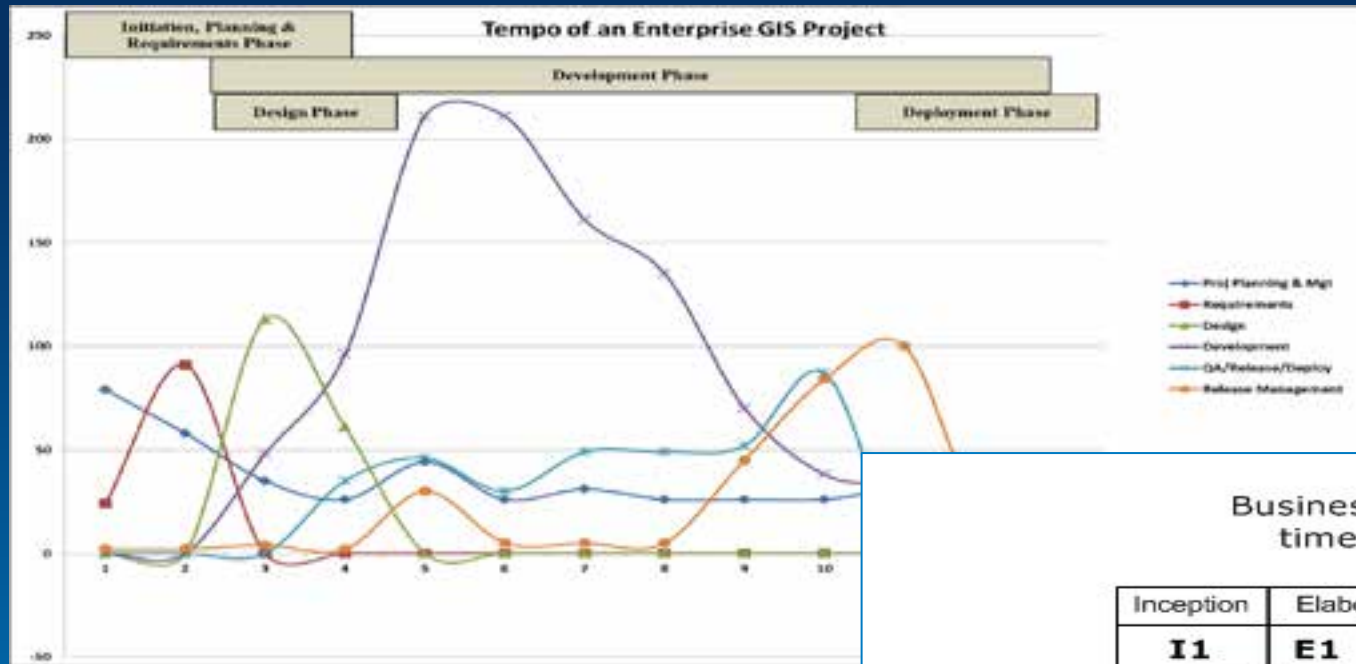
Requirements

Provide direction for program success

Figure 3: Origin of Software Defects (Source: Crosstalk, the Journal of Defense Software Engineering)

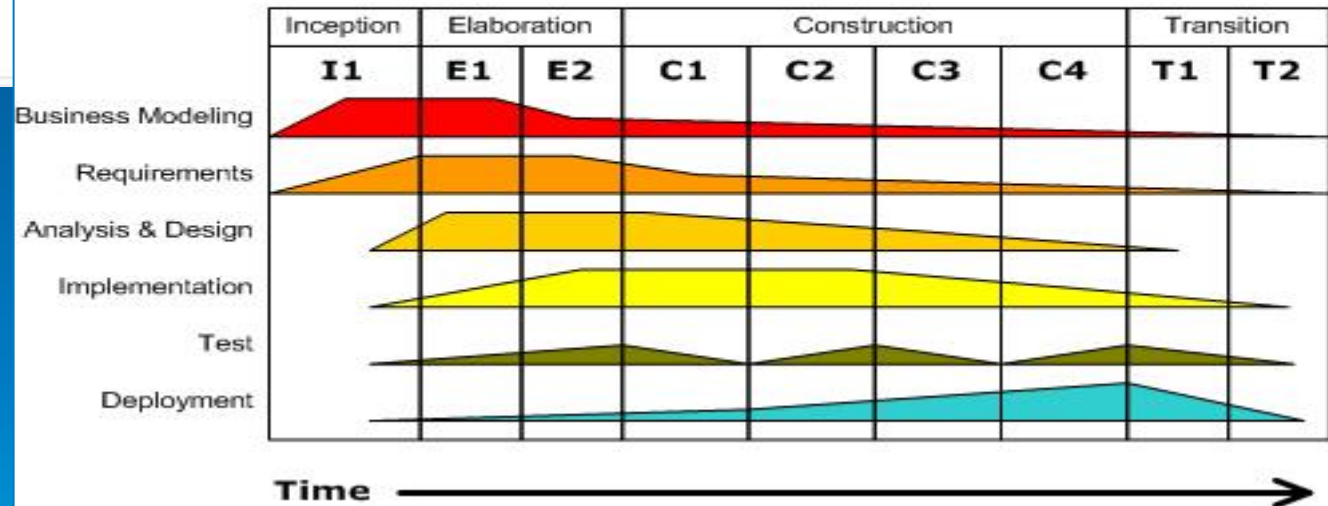


Why Requirements are Important? | Early mistakes lead to costly fixes



Iterative Development

Business value is delivered incrementally in time-boxed cross-discipline iterations.

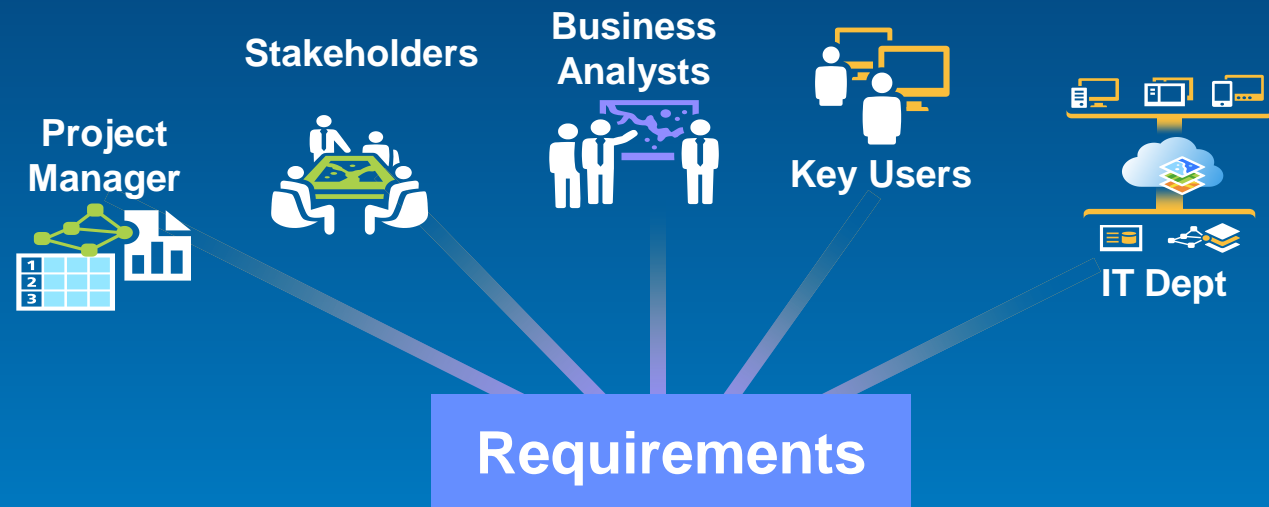


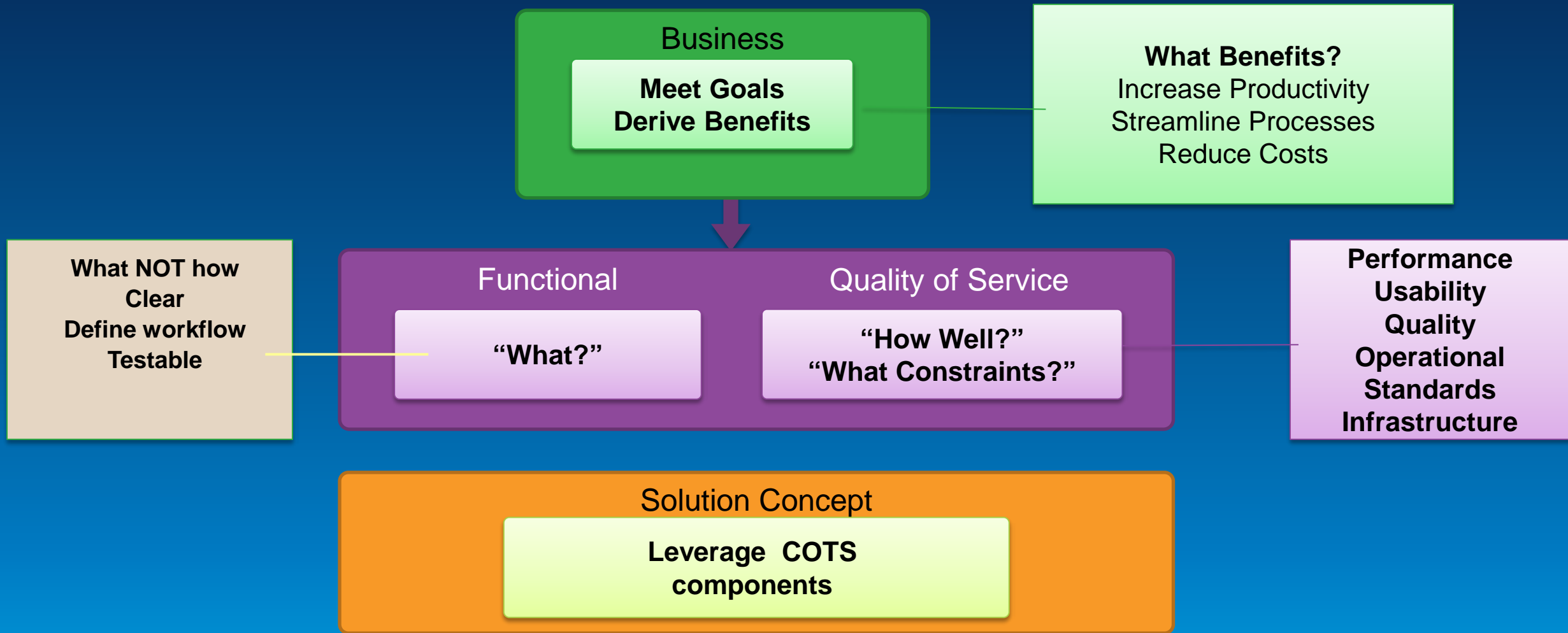
Source: Vikas Thange Blog

Where do Requirements Fit? |

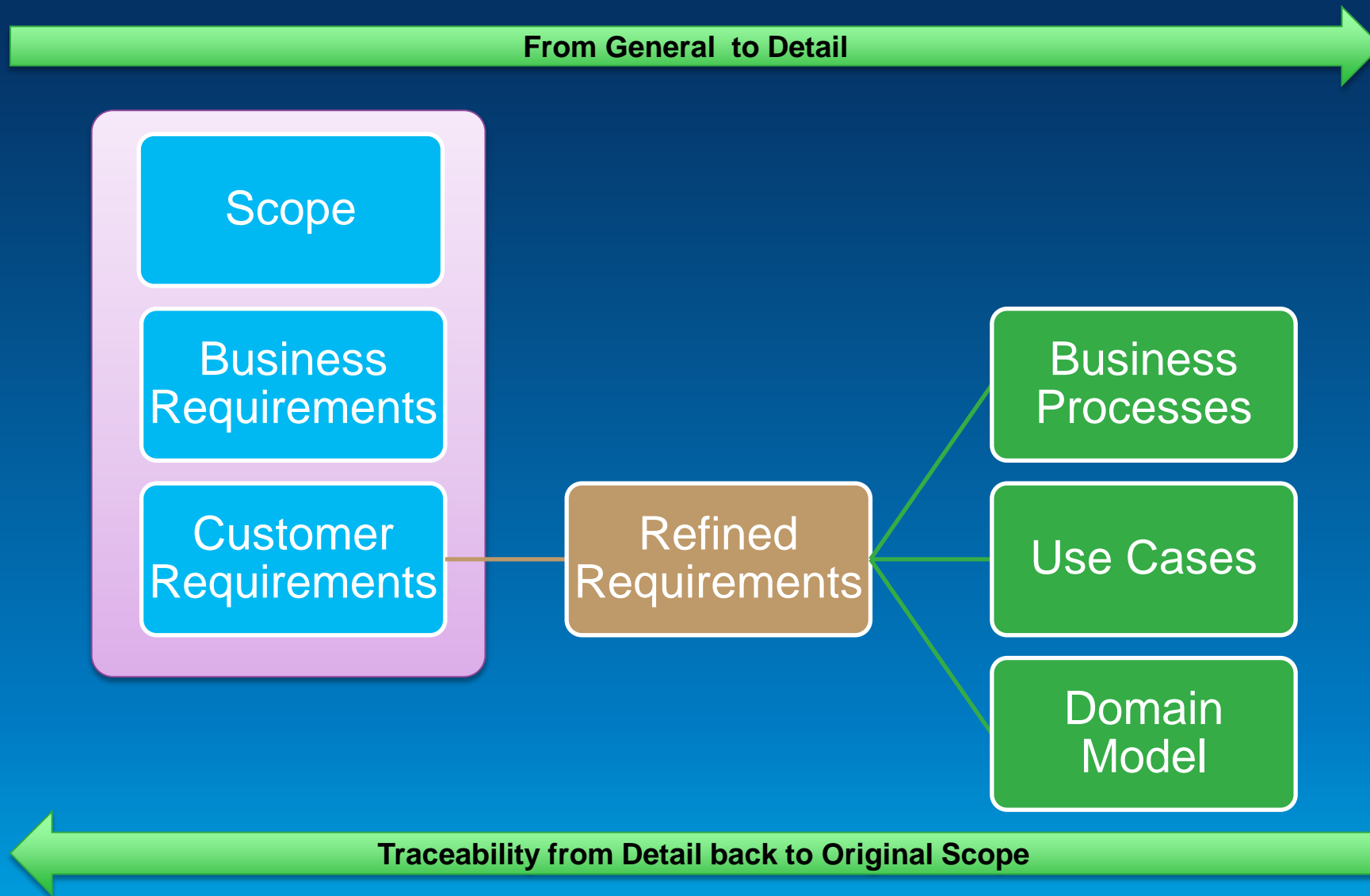
Waterfall AND Agile

- Involve the right people
- Align requirements gathering with project approach (COTS, Custom, Agile etc.)
- Invest adequate time





Requirements Types | Functional, Quality of Service, Solution Concept



Requirements Process | Specificity and Traceability

Requirements Collection

Potential techniques

COTS First

Prototyping

Scenario Walkthroughs

Workshops

Surveys

Document Analysis

Interviews



Custom

Custom built to meet business goals

Emphasis on software development

Design based on detailed functional requirements

Considerable development time / effort

Static system

COTS Components

Custom system, using some COTS elements

Emphasis on component-based software development

Design based on detailed functional requirements

Reduced development time / effort

Some capability evolves with COTS releases

COTS system

Orchestrates COTS to meet business goals

Emphasis on workflows and configuration

Design based on business goals and COTS capability

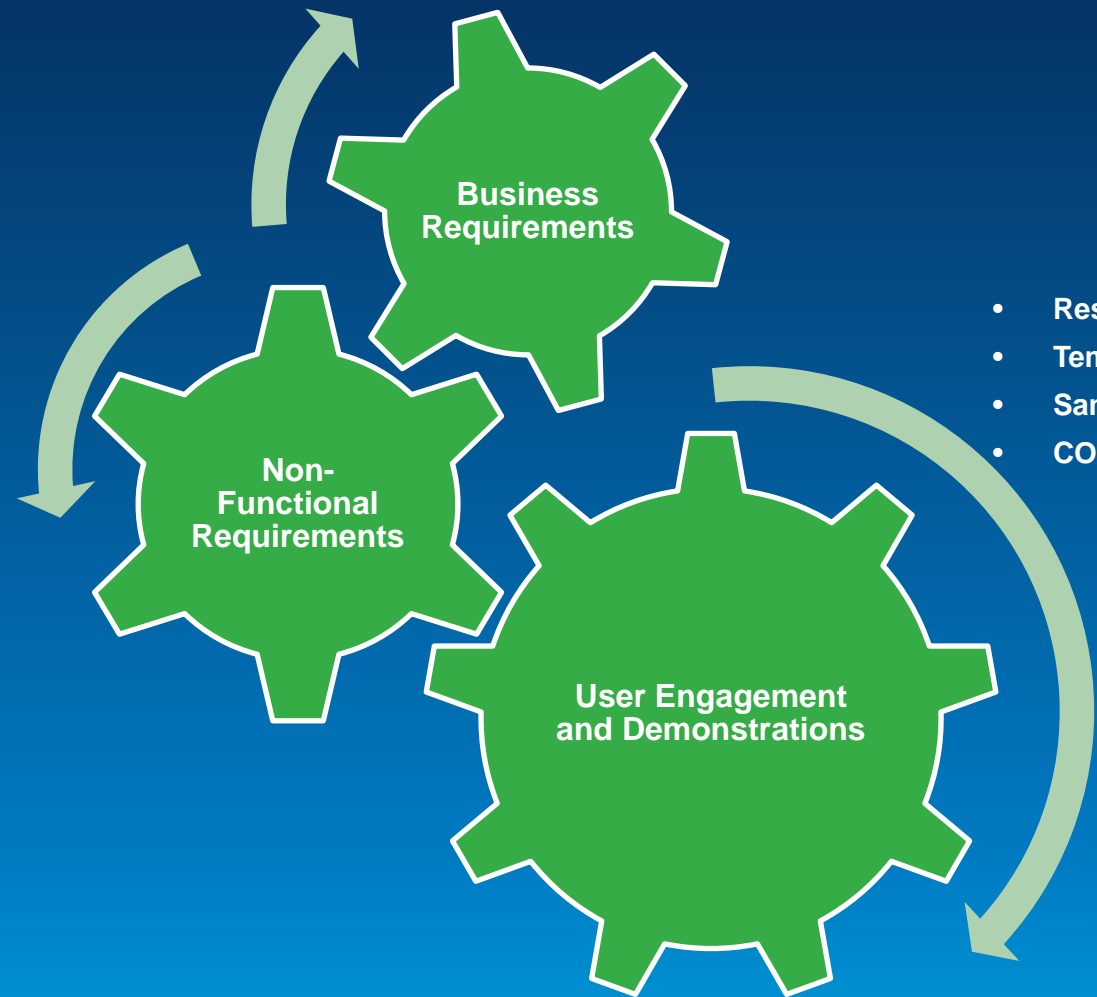
Minimized development time / effort

Evolving system with COTS releases

Custom Development

COTS Software

- Immediate capability... continually improving via COTS release cycles
- Users engaged early to define “real” requirements
- Accelerated project lifecycle and reduced time to deployment



Small focused

Allocate to iterations

Capture but prioritize

Workflows – general to detail

Vision - Get everyone on the same page

Requirements Workshop - Example

- **High Level Business Requirements**
 - **Solution should allow anyone in the public to submit a request for service via a web application.**
 - **The types of service requests is expected to be along the following lines:**
 - **Indicate where a pot hole is located**
 - **Indicate if a tree on public lands needs trimming**
 - **Indicate if there is a trash or graffiti problem**
 - **Solution is expected to streamline the process of how the public provides this information**
 - **Solution should not require GIS system expertise**

Use Case

Use Case No.: 001

Description: *Search for Service Requests*

1. *User selects "Search" from Interface*
2. *User can select from 2 search options – search by Service Request Address or Search by Service request ID*
3. *User is prompted to enter search criteria based on the chosen search option (either an SR number or partial number and wildcard (*) or a street address)*
4. *System provides search results – as a single line item, if there is an exact match, or in list format if there are multiple matches (only the top matches are displayed)*
5. *Map display zooms to the location of each service request record, once the user selects it from the search results display*

User Interface Mock-up

SUBMIT SERVICE REQUEST

CONTACT NAME |

CONTACT NUMBER |

SERVICE TYPE
FBT Hole
TRASH overflow
Other...

PRIORITY: H M L

LOCATION A
 B

ON A MAP

Pop up
Comments:

Customer Requirement

1

User Must be Able to Search Service Requests (SRs)

Refined Requirement

20	Must be able to search SRs by address	1
21	Must be able to search SRs by SR Number	1
22	Address search must support street addresses	1
23	Address search must support intersection address	1

Business Processes



Use Cases



Domain Model



Microsoft Team Foundation Server (TFS)

The screenshot displays the TFS interface. At the top, there are tabs for 'Developing Requirements', 'Work Breakdown (Results)', and 'Start Page'. Below this is a toolbar with various icons and a search bar. A table lists requirements with columns for ID, Location Path, Title, Requirement Type, Work Item, Priority, Assigned, and State. The selected requirement (ID 1408) is expanded to show details:

- Title:** Solution should allow anyone in public to submit a request for service via a web application
- Requirement Type:** Scenario
- Assigned To:** Glenn Berger
- Status:** Proposed
- Parent:** System/Increment 1

The 'Description' field contains a list of user stories:

- User can submit service request
- User is prompted for name and contact info.
- User can submit req.
- User is prompted with service type: free training, pet care, trash overflow, graffiti or other
- if other user is prompted for comments
- User is prompted to assign priority (HIGH)
- User is prompted to enter location via street intersection, street address or identification on a map
- System provides tracking number to user
- User is prompted if they want to be notified
- Upon work order completion user is emailed or contacted that issue has been resolved.

JIRA

The screenshot displays the JIRA interface showing a list of 11 issues. The table has columns for ID, Summary, Sub-Tasks, Assignees, Status, Resolution, Created, Updated, Due, and Fix Version. The issues are as follows:

ID	Summary	Sub-Tasks	Assignees	Status	Resolution	Created	Updated	Due	Fix Version
1408	Solution should allow anyone in public to submit a request for service via a web application	SYSX-7, SYSX-8, SYSX-9	Glenn Berger	Open	Unresolved	07/15/12	07/16/12	08/17/12	
1409	SYSX-6 / User has capability to add name and contact		Glenn Berger	Open	Unresolved	07/15/12	07/16/12	08/17/12	
1410	SYSX-6 / System generates work order ID		Glenn Berger	Open	Unresolved	07/15/12	07/16/12	08/17/12	
1411	SYSX-6 / System verifies email address		Glenn Berger	Open	Unresolved	07/15/12	07/16/12	08/31/12	
1412	Solution should allow user to enter 'service type' information	SYSX-11	Glenn Berger	Open	Unresolved	07/15/12	07/16/12	08/17/12	
1413	SYSX-10 / Application presents valid choices to user from training, pet care, trash overflow (etc)		Glenn Berger	Open	Unresolved	07/15/12	07/16/12	08/17/12	
1414	Solution is expected to streamline process of how the public provides information	SYSX-13	Glenn Berger	Open	Unresolved	07/15/12	07/16/12	08/07/12	
1415	SYSX-12 / If returning user, then system populates email address or name based on field entry		Glenn Berger	Open	Unresolved	07/15/12	07/16/12	08/07/12	
1416	Solution should not require GIS expertise	SYSX-15, SYSX-16, SYSX-17	Glenn Berger	Open	Unresolved	07/15/12	07/16/12	08/07/12	
1417	SYSX-14 / User can enter intersection		Glenn Berger	In Progress	Unresolved	07/15/12	07/16/12		
1418	SYSX-14 / User can select on a map		Glenn Berger	Open	Unresolved	07/15/12	07/16/12		

- **Avoid long lists of requirements**
- **Do not be judgmental**
- **Prepare for conflicting requirements**
- **Avoid requirements that are ambiguous**
- **Avoid requirements that describe HOW (unless you are using COTS approach)**



References

- **Esri project methodologies**
 - www.esri.com/services/professional-services/methodology.html
- ***Agile & Iterative Development: A Manager's Guide by Criag Larman, Addison-Wesley ,2003***
- ***Software Requirements (2nd Edition) by Karl Wieggers, Microsoft Press, 2003***
- ***Use Case Driven Object Modeling with UML by Doug Rosenberg and Matt Stephens, Apress, 2008***
- ***Writing Effective User Cases, A Cockburn, Addison-Wesley, 2001***
- ***Agile Development with ICONIX Process by Doug Rosenberg, Matt Stephens, and Mark Collins, Apress, 2005***

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Networking Reception

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Tuesday, 10:45 AM–4:00 PM

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