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## Workshop

# Developing a Framework to Analyze User Requirements in Project Extranet

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## Background

### Background

**Project Extranet has been acknowledged as a potential technology.**

- No extra hardware and software **investment**
- Application and location **independent**
- **Up-to-date** information retrieval and **improved** communication
- Cost and time **effective**
- **Few claims, greater flexibility** and so on

### Research Needs

### Aim and Objectives

### Review I

**Project Extranet is now implemented worldwide**

- **Success story** has been reported
- Surveys show that the **need** is increasing

### Review II

### Framework

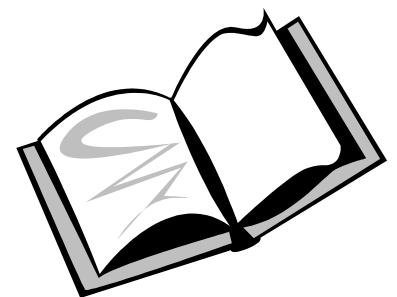
**Barriers and difficulties were found**

- **Lack** of standards and technical supports
- System **over-dependent** / information **overload**
- **Resistance** to change from the employees
- Existing communication linkage **breakdown**
- **Usability, accessibility and functionality**

### Methodology

### Work To Date

### Future Work



# Research Needs and Questions

## Background

## Research Needs

## Aim and Objectives

## Review I

## Review II

## Framework

## Methodology

## Work To Date

## Future Work

## Function-related studies have drawn research interests

- Systems' provision in functionality **varies** greatly but **no standards** to test function's completeness, difference and effectiveness
- Systems' provision is **uncertain** and is still **expanding**
- Functional studies are easily **out-of-date**
- **No solid evidence** that the systems' provision is exactly what the user needs

## Is there a gap or match between system's provision and user's requirements?

- What are the existing systems' **provision** in functionality of Project Extranet?
- How are the user requirements **elicited** and **analyzed** previously?
- Are users **satisfied** with the provision?
- Have the user requirements **met** at present by existing systems?





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# Research Aim and Objectives

Background

Research Needs

Aim and Objectives

Review I

Review II

Framework

Methodology

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## Research aim

- To pursue a **deeper understanding** of user requirements in project extranet, through developing a framework to analyse them

## Research objectives:

- To **understand** the information and collaboration needs of stakeholders in construction process
- To **investigate** the development and use of project extranets in construction industry and the benefits and barriers in the process of implementation
- To **identify** and **classify** the features that existing project extranets can provide, and **analyze** the features provision from the vendors' perspective
- To **capture** the users' acceptance and expectation to the provided features, and their potential and / or unrealized expectations
- To **develop a framework** to analyze the system's provision and users' requirements
- To **validate the framework** of analyzing system's provision and users' requirements



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# Review of Project Extranet's Development

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What and why?	How does it work?	What functions?
<p><b>Definition:</b></p> <ul style="list-style-type: none"> <li>– ASPs</li> <li>– Several different titles and categories</li> </ul> <p><b>Why is it needed?</b></p> <ul style="list-style-type: none"> <li>– Problems of construction information management (fragmentation and complexity)</li> <li>– Previous efforts such as CAD, EDI</li> <li>– Internet platform is suitable (universal platform, a large amount of tools)</li> </ul>	<p><b>Framework:</b></p> <ul style="list-style-type: none"> <li>– Centralized mechanism</li> <li>– Reduce crossing linkages</li> </ul> <p><b>Mean of access?</b></p> <ul style="list-style-type: none"> <li>– Various connections and devices</li> <li>– Mobile device and wireless connection are particularly suitable</li> </ul>	<p><b>Previous categorization:</b></p> <ul style="list-style-type: none"> <li>– Extract from previous studies</li> <li>– Not suitable due to missing, overlapping and parallel features</li> </ul> <p><b>New category proposed</b></p> <ul style="list-style-type: none"> <li>– Administration</li> <li>– Document management</li> <li>– Workflow</li> <li>– Communication tools &amp; Add-ons</li> </ul>

# Review of User Requirements Management

## Background

### Research Needs

### Aim and Objectives

### Review I

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### Work To Date

### Future Work

What and why?	RE and Techniques	Improvement Required
<p><b>Definition:</b></p> <ul style="list-style-type: none"> <li>– Condition or capability</li> <li>– How the system respond to user interaction</li> </ul> <p><b>Importance of requirements management</b></p> <ul style="list-style-type: none"> <li>– Fulfil business goals</li> <li>– Basis for the development of products</li> <li>– Increase customer's satisfaction</li> <li>– Manage cost, time and resources</li> <li>– Ensure quality of product</li> </ul>	<p><b>Requirements engineering:</b></p> <ul style="list-style-type: none"> <li>– Systematic requirements analysis</li> <li>– Covering a set of activities to analyze requirements</li> <li>– Elicitation, specification and validation</li> </ul> <p><b>Techniques</b></p> <ul style="list-style-type: none"> <li>– Traditional survey methods</li> <li>– Structured system analysis and design methodology</li> <li>– Object-oriented analysis</li> <li>– User-led requirements construction</li> <li>– Etc.</li> </ul>	<p><b>Issues:</b></p> <ul style="list-style-type: none"> <li>– Still problematic</li> <li>– Developer-led</li> <li>– Using prototype system</li> <li>– Not suit the market-driven product development</li> </ul>

# Conceptual Framework Proposed

Background

Research Needs

Aim and Objectives

Review I

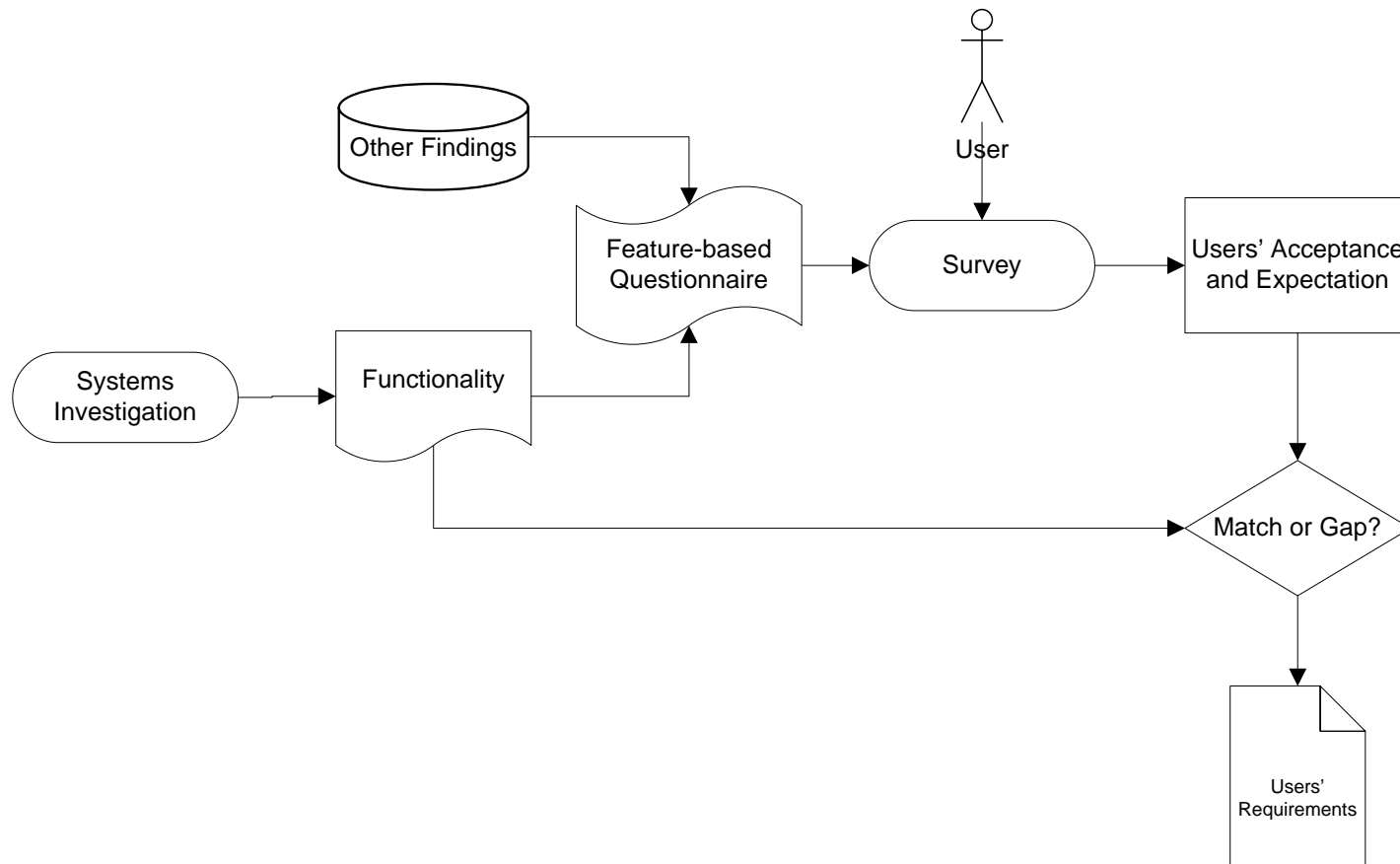
Review II

Framework

Methodology

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# Methodology

Background

Research Needs

Aim and Objectives

Review I

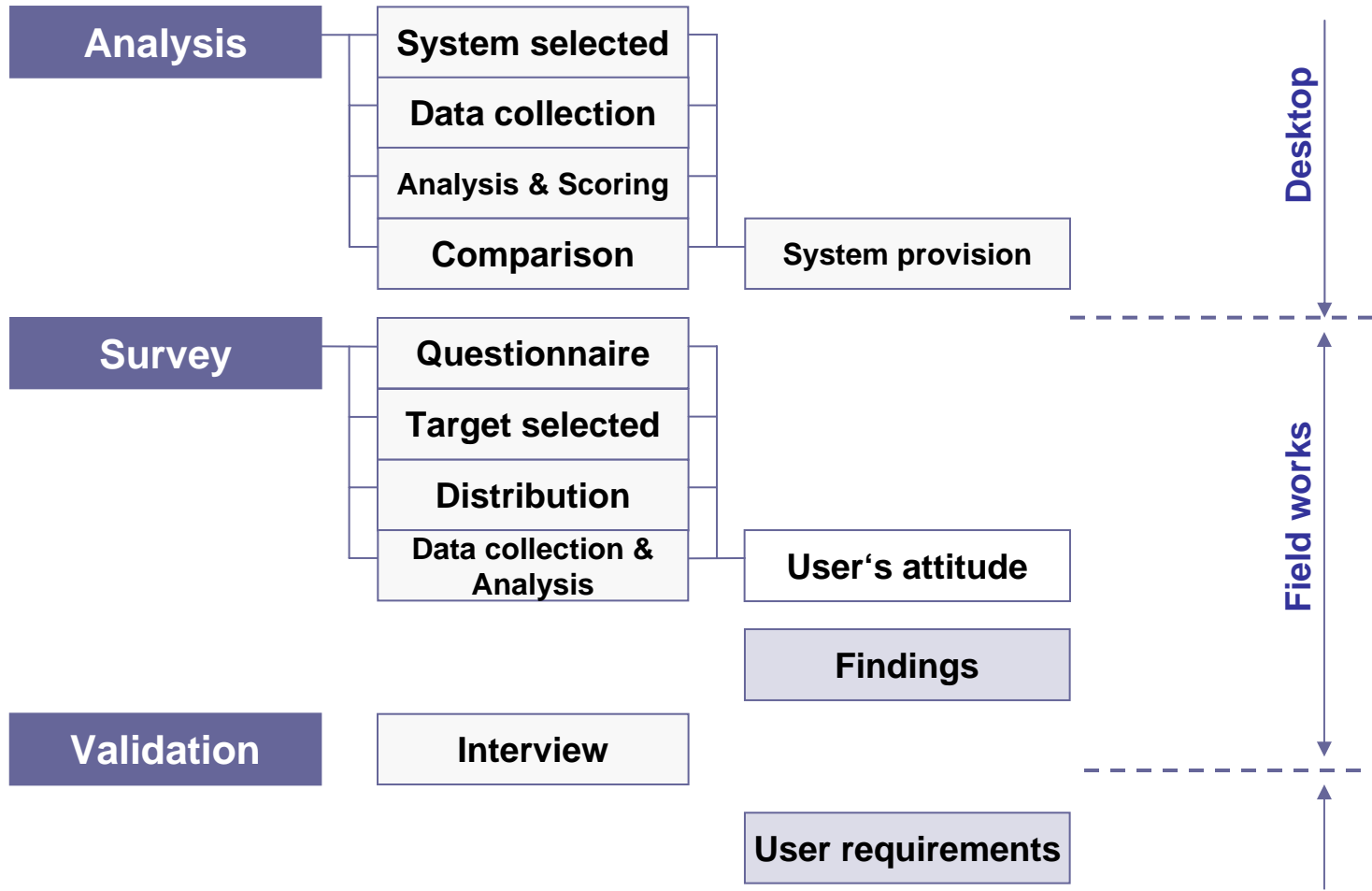
Review II

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# Work to date – Investigation of System Provision

## Background

### Sample selected

- Selection criterion is the **functionality** that the systems can provide
- **NCCTP** members
- Some **leading** vendors (e.g. Buzzsaw)
- **Others** are selected randomly from directories

## Research Needs

## Aim and Objectives

## Review I

### Sources of materials for investigation

- **Vendors'** web-pages, brochure, white papers, demo software, reports, etc
- Request for information (**RFI**) to vendors
- Some results of **previous studies**
- Actor playing

## Review II

## Framework

## Methodology

### Scoring system employed

- Based on the “**Yes or No**” pattern
- Check **availability** of a certain feature in a specific product
- Sum up and reach the **result** for all features and samples
- Make the **comparison** and analyze the results

## Work To Date

## Future Work



## Work to date – System Provision (Sample table)

### Background

### Features associated with document management

### Research Needs

### Aim and Objectives

### Review I

### Review II

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### Work To Date

### Future Work

Characteristic	4P	ACO	AD	AS	BC	BIW	CAD	CT	CWT	EP	HP	THE	PP	VIE	%
File upload / download	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
File encryption	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
File sharing / publishing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
Remote viewing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
Mark-up / revise	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
Notification of change / new	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
Search tools	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
Track record and history	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
Printing-out	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
Muilt-format support	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
File storage and archival	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	86
Workflow Integration	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	N	Y	64
Disaster protection	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	Y	Y	Y	71
Feature number	13	13	13	13	13	13	10	12	13	10	11	12	12	13	
Percentage	100	100	100	100	100	100	77	92	100	77	85	92	92	100	

# Work to date – System Provision (Findings)

Background

Research Needs

Aim and Objectives

Review I

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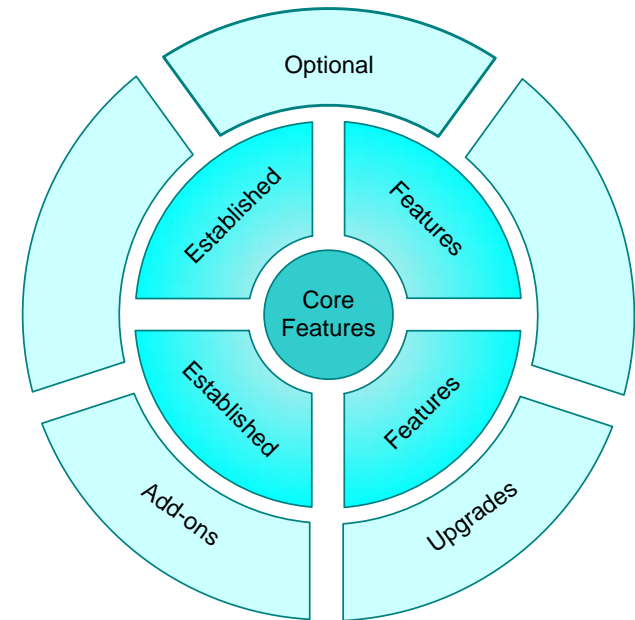
Methodology

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## Differences in availability

- No any system can be regarded as a full solution
- Only 6 of 14 have more than 80% listed features
- Document management associated features have the highest level of availability
- Communication tools & Add-ons get the lowest percentage
- Features can be classified as Core, Established and Immature / Optional



## Others

- Systems have no significant shortage in major functions
- Priority has been given to Security and file encryption
- Usability and compatibility are considered
- Some systems are immature with incompleteness / bugs

## Work to date – Questionnaire Survey

### Background

### A questionnaire has been designed

- Function category and all associate features are **mirrored**
- It collects information about the users' **acceptance** and **expectation** to features
- It is a **fillable** one, in order to be completed and returned electronically

### Research Needs

### Aim and Objectives

### Review I

### The questionnaire has been distributed

- **Pilot survey** has been conducted within our school
- Targeted **recipients** are those construction management personnel
- It is distributed through mailing-list (CNBR), **mail** and **fax**
- Request for the **vendors' assistance**, to gather their customers' comments

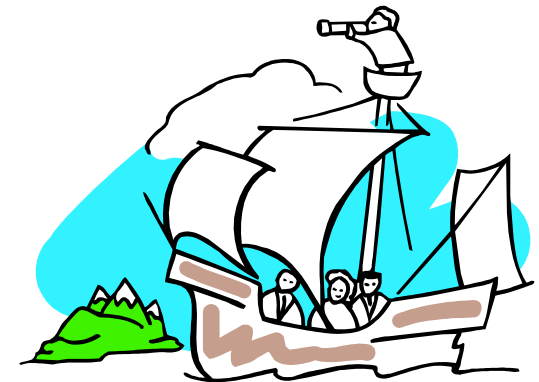
### Review II

### Framework

### Methodology

### Work To Date

### Future Work



## Future Work

### Background

### Carry on survey and interview later

- Feedback rate is very low
- Distribute more widely and directly
- Alternative method is being considered

### Research Needs

### Aim and Objectives

### Thinking about if there is function overload issue

- Many information systems are found function overload, so is it the case in Project Extranet?
- Judgement needs the input from user's perspective

### Review I

### Review II

### Framework

### Carry on writing-up

- Research is due completion by the end of this year

### Methodology

### Work To Date

### Keep on publicising findings

- International Postgraduate Research Conference
- Journal paper

### Future Work





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# Thank you!