

# State-of-the-art & Future Trends in Requirements Information Management

PhD Researcher

Abdou Karim Jallow - [A.K.Jallow@lboro.ac.uk](mailto:A.K.Jallow@lboro.ac.uk)

Supervisors

Dr. Peter Demian - [P.Demian@lboro.ac.uk](mailto:P.Demian@lboro.ac.uk)

Prof. Andrew Baldwin - [A.N.Baldwin@lboro.ac.uk](mailto:A.N.Baldwin@lboro.ac.uk)

Prof. Chimay Anumba - [anumba@engr.psu.edu](mailto:anumba@engr.psu.edu)

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## Presentation Outline

- Introduction
- Research Methods
- Related Work
- State-of-the-art
- Future Trends
- Discussion/Conclusion
- Questions

## Introduction

### ■ Aim

- help reduce operational cost and time in construction
- Increase productivity and quality of construction facilities
- through better requirements information management

## Introduction

### ■ Objectives

- Provide a theory of Requirements Information Management for Construction Projects
- Define a conceptual framework taking a socio-technical view point to enhance life cycle requirements information management to support business processes, product and service delivery.
- Develop a prototype of the framework and validate it using case studies.

## Research Methods

- Literature Review
- Participatory observations
  - Project meetings
- Interviews
  - Informal interviews
  - Project managers & other stakeholders
- Survey Questionnaires
- Case studies

## Related Work

### • Requirements Management

- “Requirement management is the process of creating, disseminating, maintaining, and verifying requirements.” (Fiksel & Hayes-Roth, 1993)
- “Requirements Management is the set of activities encompassing the collection, controlling, analysis, filtering and documentation of a system’s requirements.” (Ferne et al., 2003)
- “Requirements management is the process of identifying stakeholders and their needs, and documenting them in a form that is amendable to analysis, communication and subsequent implementation.” (Nuseibeh and Eaterbrook, 2000)
- Client requirements can be described in terms of the objectives, needs, wishes and expectations of the client (i.e., the person or firm responsible for commissioning the design and construction of a facility) (Kamara et al., 2000)

## Related Work

### •Tools

- Manual computer packages
  - Word processing, spreadsheets, databases etc
- Automated computer packages
  - DOORS – standalone, LAN or DOORSNet (Internet base) – from Telelogic – Mostly Software and Manufacturing Industry
  - Slate – Groupware base - from UGS – Predominantly Military Industry Oriented
  - Caliber-RM – Internet base- from Borland – Software Industry predominant
  - None is standardised use in Construction Industry

## Related Work

- Briefing

- The process of specifying the general requirements a construction must reach in order to fulfil the intended purpose. (Ryd, 2004)

- Brief

- Brief is a comprehensive, formal statement or document that is the medium for expressing or communicating the objectives and needs of the client. (Kamara et al, 1999)

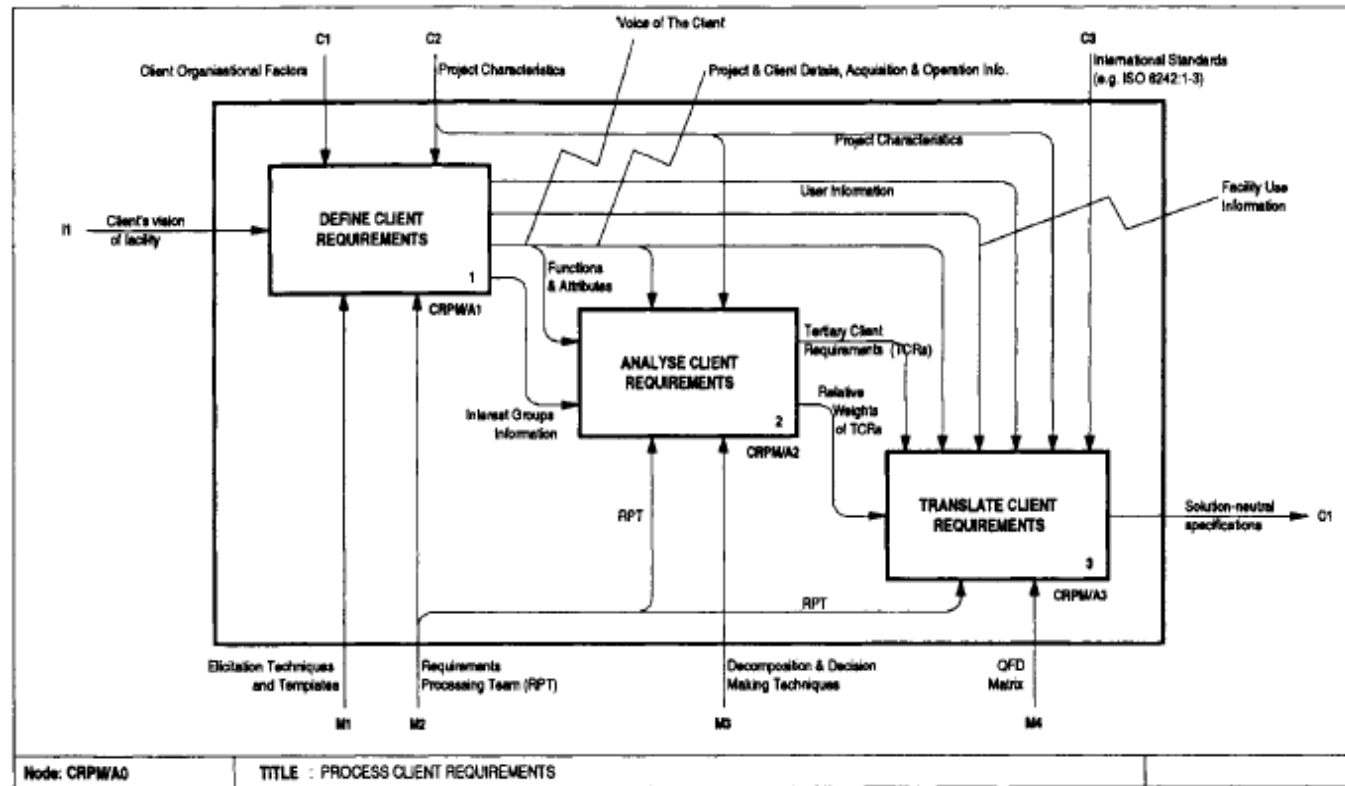
- Client requirements processing

- The identification, structuring, analysis, rationalization, and translation of explicit and implicit client requirements into solution-neutral specifications for design purposes (Kamara et al., 1997)

## Related Work

- Client Requirements Processing Model

- CRPM

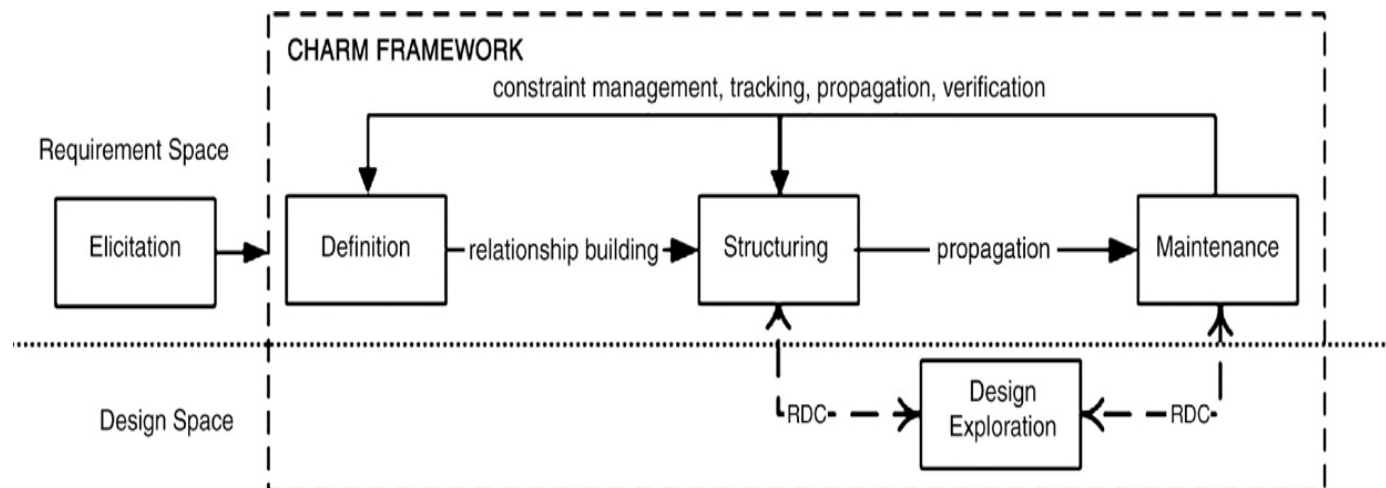


(Kamara et al., 2002)

Source: Capturing Client Requirements in Construction Projects

## Related Work

- Requirements processing models
  - CHARM



Computational hybrid assistance for requirement management  
(CHARM)

Source: Ozkaya and Akin (2005)

## Related Work

- Requirements management and other phases
  - Construction, operations, maintenance/refurbishment, disposal
- Requirements Change and Impact Analysis
  - Client proposal
  - Contractor proposal
  - Architecture and Structural Engineer proposal
  - External Project Managers
- Communicating requirements
  - Emails, telephone, meetings
  - Project extranets – shared network drive

## State-of-the-art

- Requirements documentation
  - Word processors, spreadsheets, databases, Disc/CDs, PDF Files etc (Mainly document oriented)
- Communicating requirements
  - meetings, telephone, emails, Project extranets
  - Drawings, specifications
- Requirements Change
  - Change request instructions
  - Meeting decisions, telephone, emails

## Future Trends

- Life cycle requirements management across all phases
  - RIBA Plan of work, Process Protocol
- Rationale to be included in requirements documentation
- Requirements management system to be both process and product aware
- Automation of change request taking a Business Process Management (BPM) approach
- Integration of Requirements systems and change request system

## Future Trends

- Traceability between high-level and subsystems requirements
- Forward and backward traceability
- Visibility – What state a particular requirement is
- Object-oriented database implementation
- Web-Interface for remote access (Collaborative working)
- SOA to enable interoperability

## Conclusion

- Requirements management – ad-hoc process
  - Time consuming and expensive
- Silos of requirements
  - Different versions used by different people in different places
- Requirements change decisions mostly in meetings
- Lack of interoperability between systems
- Requirements management to be information centred rather than document centred

Thank you

Home in time for tea



QUESTIONS