

# **Protocol**

## **Systematic Mapping Study of**

### **Distances between RE and Software Development**

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v 1.0

### **Context, Objectives and Research Questions**

In researching REVV alignment, we observed that distances seem to affect the coordination between roles and artefacts in the two domains. For this reason, a literature study has been initiated to investigate to which extent the concept of distance between RE and other SE disciplines has been researched and which types of distances have been observed. A systematic map of the area is the first phase of this. The aim is to investigate the following:

RQ: What is reported in the current peer-reviewed research literature about distances in the software development process, in particularly between RE and other development activities?

- i. What distances have are reported in peer-reviewed literature?
- ii. To which extent is 'distance' used in GSD versus non-GSD articles?
- iii. For which RE areas/activities has the concept of distance been researched?
- iv. Towards which other development processes are RE distances investigated?

### **Method: Review Process including Selection criteria**

The details of the literature search were defined iteratively. The scope of the literature research was set by defining keywords and selection criterion relevant to the research questions. These keywords were tested in well-known databases and the selection criteria applied to the search results to identify papers that were out of scope. Based on the outcome of these test searches, a set of databases were identified and the keywords and selection criteria were refined to enable locating a high degree of suitable papers through automatic searches.

#### **Keywords**

X: distance

Y: requirement OR development OR software engineering

NOTE: Distances for requirements engineering is the main focus of this study. However, searching purely on 'requirement' gave a very narrow search scope. For this reason, the more general terms 'development' and 'software engineering' were also included in the automatic search. In this way,

papers that cover the whole development process including the requirements phase were also included. Papers clearly NOT related to RE were then excluded in the next step.

Exclude papers with titles including one of 'learning', 'education', 'teaching', 'training'. This excludes papers related to distance learning etc.

Final search performed: 2012-10-03

### Selection criteria

- Peer reviewed
- English
- Within the right domain judged by title
- Within scope of study judged by title, abstract and keywords. Primarily check the context of the word 'distance'. If needed, the full text (primarily Intro and Conclusions) are used for inclusion/exclusion.

NOTE: The 'domain' was decided to be RE, but also papers covering software development in general, i.e. including the requirements management even in the cases that requirements were not specifically mentioned in the abstract, but rather development in general is mentioned.

### Data sources

The following data sources are used. For each source the following no of papers were found for the final search:

Source	Initial selection (auto search)	After title review	After abstract review
SciVerse	51	7	2
IEEE Xplore	79	4	1
ACM Digital Library	1951	52	33
Inspec	346	11	0
Compendex		74	17
GRAND TOTAL	2427	148	53

### Method: Constructing the Map







Exploratory coding of the abstracts is performed to categorize the papers to enable answering the RQs (distance type, GSD vs non-GSD, software development area, RE area). The papers are also categorized according to research type ([Wieringa]). When needed, the full text (primarily introduction and conclusions) are reviewed to ensure a correct understanding and subsequent coding / classification of the papers.

## APPENDIX: Search Strings

- IEEE Xplore (<http://ieeexplore.ieee.org>)
  - Conference and Journal publications
  - Topic: Computing & Processing (Hardware/Software), General topics for Engineers (Math, Science & Engineering), Engineering Profession

You searched for: (((("Abstract":'software engineer') OR "Abstract":'software development') OR "Abstract":requirement) AND "Abstract":distance)

You Refined by:

Publication Title: Communications, IEEE Transactions on , Information Theory, IEEE Transactions on , Selected Areas in Communications, IEEE Journal on , Proceedings of the IEEE , Global Software Engineering, 2009. ICGSE 2009. Fourth IEEE International Conference on , Knowledge and Data Engineering, IEEE Transactions on 

NOTE: Exclusion for 'learning' etc had to be done manually since 'NOT' operator had no effect

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- SciVerse (<http://sciencedirect.com>)
  - Subject: Computer Science, Engineering

((TITLE-ABSTR-KEY(testing) or TITLE-ABSTR-KEY(verification)) OR (TITLE-ABSTR-KEY(requirement) or TITLE-ABSTR-KEY(development)) OR (TITLE-ABSTR-KEY('software engineering')))[All Sources(Computer Science,Engineering)] AND ((TITLE-ABSTR-KEY(distance) and not TITLE(training)) AND (TITLE-ABSTR-KEY(distance) and not TITLE(teaching)) AND (TITLE-ABSTR-KEY(distance) and not TITLE(learning)) AND (TITLE-ABSTR-KEY(distance) and not TITLE(education))[All Sources(Computer Science, Engineering)])

- ACM Digital Library ([dl.acm.org](http://dl.acm.org))
  - Publication types: Journal, Proceedings, Transaction, including ACM Computing literature
  - Distance in Abstract and any of (requirement development software verification testing), not (learning, education, teaching, training)
  - Found none using:  
(Abstract:distance) and (Abstract:requirement or Abstract:'software development') and (not Title:learning and not Title:education and not Title:teaching and not Title:training) and (PublishedAs:journal OR PublishedAs:proceeding OR PublishedAs:transaction )
- Inspec and Compendex (<http://www.engineeringvillage2.org>)
  - Document type: Journal and Conference articles
  - Classification code: Computer Applications, "Computer Software, Data Handling and Applications", "Management", "Digital Computers and Systems", "Testing", "Engineering Research", "Computer Systems and Equipment"
  - Exclude classification: "Mathematics", "Telecommunication", "Data Processing and Image Processing, "Numerical Methods", "Education", "Optical Communication", "Telephone Systems and Related Technologies; Line Communication", "Computer-aided instruction", "production facilities and engineering", "engineering materials", "mechanics", "mathematical statistics", "Light/Optics", "Chemistry", "Electricity: Basic Concepts and Phenomena", "Information Theory and Signal Processing", "Accidents and Accident

Prevention", "Semiconductor Devices and Integrated Circuits", "Strength of Building Material", "Computer Theory", "Computer Peripheral Equipment", "Light, Optics and Optical Devices", "Instrumentation", "Physical Properties of Gases", "Combinatorial Mathematics", "Computer Circuits and Logic Element", "Engineering Graphics", "Highway transportation", "Fluid flow", "Codes and Standards", "Robotics", "Radio systems and Equipment", "Geology", "Chemical products", "Electric transmission and distribution", "biological materials and tissue engineering", "chemical operations", "organic compounds", "biology", "urban and regional planning and development", "soils and soil mechanics", "control devices", "environmental impact", "production planning and control", "biology and medical computing", "societies and institutions", "buildings and towers", "medicine and pharmacology", "aircraft, general", "mechanical and miscellaneous measuring instruments", "data security", "groupware", "mechanical variables measurements", "vision", "data communication, equipment and technicians", "biomedical engineering"

"distance" wn KY AND ("testing" OR "verification" OR "requirement" OR "development" OR "software engineering") wn KY) NOT ("learning" OR "education" OR "teaching" OR "training") wn TI