

Usability Promotion in a Technical Project with Sparse Resources – a Case Study

Kaarina Karppinen
Marja Liinasuo



Business from technology

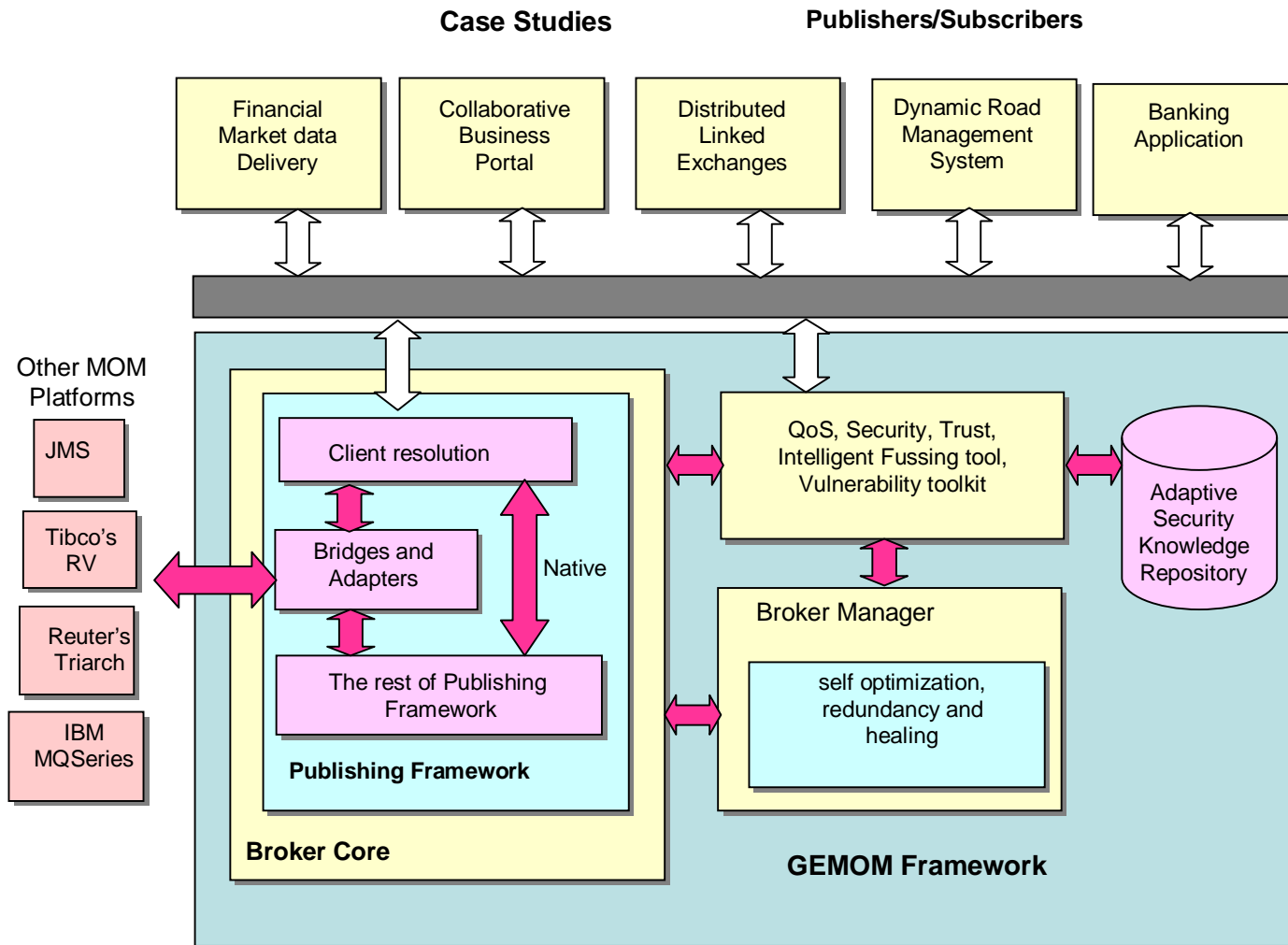
Technical Research Centre of Finland

GEMOM project

- GEMOM (Genetic Message Oriented Secure Middleware) project: secure middleware development including five different case studies
- Middleware connects various software components or applications together - Publish-Subscribe variant of a MOM transmits various types of messages between applications
 - no direct human users!
- Still, one of the project's aims is better usability of the end product without risking the security of it
- The main idea is to perform usability studies as early in the project as possible so that the studies could have an actual effect on the middleware functionalities perceivable by human users



The overall conceptual framework of GEMOM



Extract from the project plan

- “Quality of service and security solutions strongly affect and users. This task will study the implications of quality of service and security solutions on applications and end users. The technical solutions will be interpreted into scenarios of usage. These scenarios and actual concepts will be evaluated with end users to study factors that affect user acceptance of the solutions. Key research issue will be how users see faults, how they understand them, and how they can follow with in healing from the faults.”



Challenges in usability promotion in our project

- Deeply technical project
- Technically oriented project members
 - User only perceived as the source for requirements definition
- Usability related task not clearly defined
- Direct end users not evident
- Very limited work allocation for human factor studies
 - Excludes the possibility of a usability specialist to e.g. interview or lead usability workshops
- Main questions:
 1. How to motivate usability studies in a project without direct end users?
 2. How to perform usability studies with sparse resources?

Finding the users

- The predefined project plan stated that

User acceptance shall be obtained with the help of scenarios; the new technical solutions would be interpreted into scenarios of usage, which would then be evaluated with the users.

- No user interface -> concentrate on the functionalities of the middleware as seen by the human user
- Who are the users evaluating user acceptance?
 - User classification, description and examples developed in each case study

USER CLASSIFICATION	DESCRIPTION	EXAMPLE
(1) Marginal end users: <i>technical expertise needed: low; not at all or very little possibilities to evaluate the quality of middleware functioning</i>	People furthest away from the middleware, still benefiting from its functioning in some remote way citizens, employees or managerial superiors receiving the service via some professional or using the technology by him/herself mostly for reading purpose	<ul style="list-style-type: none"> - citizen in an emergency situation (CBP) - representatives of public bodies in partnership (CBP) - departments as customers for procurement services (DLE) - public organizations receiving information about roads and traffic (DRMS) - private organizations receiving information about roads and traffic (DRMS) - bank's quality assessing operator (BA) - branch/bank director (BA) - auditor (BA)
(2) Service-providing end users <i>technical expertise needed: moderate; some possibilities to evaluate the quality of middleware functioning</i>	Personnel using the software application related to the middleware	<ul style="list-style-type: none"> - trader or financial analyst (in-house or external institutional investors in e.g. banks and insurance companies) (FMDD) - field worker using systems (CBP) - emergency planning officer, i.e. regional partnership coordinator (CBP) - procurement professionals working for e.g. public administration, i.e. regional partnership representatives (DLE) - head of procurement for a partner local authority (DLE) - representatives in business community (DLE) - mobility data followers and information feeders (DRMS) - bank's online customer (BA) - bank's counter clerk (BA) - bank's call-centre operator (BA) - bank's third signature office clerk (BA)
(3) Service-supporting users <i>technical expertise needed: fairly high; some possibilities to evaluate the quality of middleware functioning</i>	Personnel supporting service by modifying the functionalities of the software related to the middleware; their work is related with the service, not with technical maintenance	<ul style="list-style-type: none"> - financial engineer or application and service developer (FMDD)
(4) Technically expert users <i>technical expertise needed: high; good possibilities to evaluate the quality of middleware functioning</i>	Personnel responsible for the maintenance of the technical system, interested in middleware from a technical viewpoint	<ul style="list-style-type: none"> - system administrator (DRMS) - system manager (BA)

Bold text = users chosen for evaluating user acceptance

FMDD = Financial Market Data Delivery
 CBP = Collaborative Business Portal

DLE = Distributed, Linked Exchanges
 DRMS = Dynamic Road Management Systems
 BA = Banking Application



Overcoming the lack of resources

- Technical experts harnessed to assist in usability evaluation
- Case studies provide the human users for usability studies
- Usability expert concentrates on acting as a supervisor; planning and analysing the usability implementation and its results

Usability implementation

- Usability evaluation will be realised mainly by non-usability experts -> a stepwise approach with well-defined instructions for each step
 1. Case study representatives define and describe the users affected by the functioning of the middleware in their case study
 2. Technical experts describe the technical solutions from the perspective of the users, i.e. the effect of the solution as can be perceived by the human users
 3. Leader of each case study produces the scenarios with the users
 4. The case study leaders send the scenarios to the usability expert who will check their meaningfulness and return the checked and possibly corrected scenarios with focused questions related with each scenario
 5. Users in each case study answer the questions, and the answers are sent to the usability expert who analyses them and produces a report about user acceptance

So far...

- We have performed two out of five steps
- We have had practical challenges with
 - providing extensive but not exhaustive instructions
 - similar understanding of terms between usability expert and software engineers
 - “User” means human users in HCI but may mean applications in software engineering
 - “Scenario” stands for short stories describing a work process from the human user’s viewpoint in HCI but may mean a system description or a case study in SE

Future

- The project will continue for almost 2 more years - This paper describes a work-in-progress, and more will be learned when the project is progressing
- Questions? Suggestions?

Thank you!

KAARINA KARPPINEN

Research Scientist, M.Sc.

Tel. +358 20 722 2373

GSM +358 40 548 7058

Fax +358 20 722 2320

Email Kaarina.Karppinen@vtt.fi

**VTT TECHNICAL RESEARCH
CENTRE OF FINLAND**

Security Assurance Team
Kaitoväylä 1, Oulu, FINLAND

MARJA LIINASUO

Research Scientist, Ph.D.

Tel. +358 20 722 6452

GSM +358 400 912 711

Fax +358 20 722 6027

Email Marja.Liinasuo@vtt.fi

**VTT TECHNICAL RESEARCH
CENTRE OF FINLAND**

Systems Usability Team
Vuorimiehentie 3, Espoo, FINLAND

