To Ensure the Reliability of Information Systems

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Corporate Senior Executive Vice President
Fujitsu Limited
Agenda

- What is the reliability of information systems?
- What is needed to ensure reliability?
- Fujitsu’s approach to ensure reliability
- Wrap up ~To Ensure Reliability
What is the reliability of Information Systems?

From a User’s point of view...

To realize the expected role of the information system throughout its lifecycle

Both users and vendors must mutually understand the role of the system and make efforts to realize it.
What is needed to ensure reliability?

Engineering cannot be the only solution to ensure reliability.

Users and Vendors must understand the requirements correctly and Vendors develop the function with quality based on the requirements.

Key Point: Elimination of ambiguity and visualization of the requirements
Fujitsu’s approach to ensure reliability

To understand the requirements correctly

Fujitsu develops common views (measures) collaborating with other vendors and users.

To develop the function with quality based on the requirements,

Fujitsu is using the approach of “Four Innovations” to improve system development.
Developing common views (measures) collaborating with other vendors and users
Fujitsu’ s approach to ensure reliability


2. Ensuring the quality with Top Executives (2004~)

3. Customers’ view study group (2006 - )

Fujitsu’s approach to ensure reliability

Developing common views (measures)


Common measures for planning, development, operation and maintenance of Information Systems to help mutual understanding of each work item through the life cycle process.

2. Ensuring the quality with Top Executives (2004~)

Recommendation on involvement of Top Executives of users to clarify the role sharing between vendors and users in the development of Information Systems.
Developing the common views (measures)

3 Customers’ view study group (2006 -)

Pursuing how to describe external specification in an easy-to-understand way for users and how to build consensus in business application development.

4 The Grades standards for Non-functional requirements (2007~)

Visualization of Non-functional requirements such as performance, operability, security and formulation of the guidelines for user-friendly methods for consensus building between users and vendors.
<table>
<thead>
<tr>
<th></th>
<th>Fujitsu’ s approach to ensure reliability</th>
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<tbody>
<tr>
<td>2</td>
<td>Ensuring the quality with Top Executives (2004~)</td>
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<tr>
<td>3</td>
<td>Customers’ view study group (2006 -)</td>
</tr>
<tr>
<td>4</td>
<td>The Grades standards for Non-functional requirements (2007~)</td>
</tr>
</tbody>
</table>
SLCP-Japan Common Framework 2007
Revised from SLCP-J CF ‘98

Agreement Processes
- Acquisition Processes
- Supply Processes
  
Primary Processes
1. Planning Processes
2. Requirements Building/Developing Process

Development Processes
- Maintenance Processes
- Operation Processes

Organizational Processes

Software Support Processes

Software Reuse Processes

Contract Change Mgmt Processes

added and tailored in JCF
Fujitsu’s approach to ensure reliability


2. Ensuring the quality with Top Executives (2004~)


Appendix: Seventeen Principles

1. Expectations of users and vendors often differ
2. Any decision consists of agreement and approval
3. Never postpone decisions crucial to the project
4. Never proceed to the next process without agreement by stakeholders
5. Multi stage contract decreases risks for both parties
6. System development costs you much more than software development does
7. Emphasize system life cycle cost
8. The objective of the project is meaningful only when everybody knows it
9. Requirements are attributed to users after all
10. Requirements definition is the baseline of development
11. Good requirements definition describes new business system in detail
12. Never implemented are unexpressed requirements
13. Qualitative expressions are interpreted in a developers favorite way
14. No such requirement as ‘Just same as present’
15. An ideal business system will never be realized
16. Functional requirements diverge, cost and schedule converge them
17. Users are accountable for requirements definition

*for each principle, disciplines in action are described for both user and supplier*
Fujitsu’s approach to ensure reliability

2. Ensuring the quality with Top Executives (2004~)
3. Customers’ view study group (2006 - )
Customers’ view study group

[Area targeted by Customers' view study group]
"Study group for customers' view on requirements specification based on a practical approach" (called "Customers' view study group" hereinafter) targeted the "External design" phase because it is the phase where developers have lots of contact with customers and customers are involved until program production.

Then the group targeted three technology areas: "Screen", "System behavior" and "Data model".

(Excerpt from the public presentation by Customers’ view study group on March 18, 2008)
Customers’ view study group

Customers’ view guideline (Screen design edition)

Chapter title

The points in description example are further explained in speech balloon.

Explanation of description example

Description example, showing both undesirable and desirable examples which actually appeared in design documents. This example shows one of the tips when drawing screen transition diagrams.

Introducing , as a tip, ingenuity and things to note either to prevent misunderstanding or to find perception gap.
## Fujitsu’s approach to ensure reliability

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</tbody>
</table>
Why the Grades (levels of) standards are needed…

Challenges for Vendors/Users on Non-functional Requirements

It is difficult to clarify Non-functional requirements at early stage of planning

As requirements or specifications are still vague in the upper process of the planning, vendors and users cannot have mutual understanding on Non-functional requirements.
The Grades standards for Non-functional requirements

Image of the Grades standards

Each item of the requirements: Classification of expected features

Grade Chart

<table>
<thead>
<tr>
<th>Item</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Operability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency response</td>
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</table>

Levels chart

Help mutual understanding on requirements by indicating options for each requirement.

We need the system performance in an emergency...

The impact of emergency on business and recovery level will be like this...

Determine the level of emergency response

Discussion and assumption on emergency response by vendors and users.

e.g. Emergency response

1. Protect data as restorable format
   Cost and Development period: Low and Short

2. Ensure business continuity in case of failure in each equipment
   Cost and Development period: Middle

3. Ensure business continuity in case of larger disruption
   Cost and Development period: high and Long

Grades (Levels)
List options for each requirement
## The Grades standards for Non-functional requirements

### Schedule

<table>
<thead>
<tr>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First half</td>
<td>Second half</td>
</tr>
<tr>
<td>Primary discussion</td>
<td>Collect examples and</td>
<td>Draft Non-functional</td>
</tr>
<tr>
<td>by voluntary</td>
<td>review representation</td>
<td>Grades standards</td>
</tr>
<tr>
<td>vendors</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pick out Non-</td>
<td>Aggregated knowledge of</td>
<td>Review by Users</td>
</tr>
<tr>
<td>functional</td>
<td>venders</td>
<td></td>
</tr>
<tr>
<td>requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start</td>
<td>Interim output</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Draft Grades Standards</td>
<td></td>
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</tbody>
</table>

### How to utilize the Grades standards

- **Through industry-wide**
  - Build consensus on Non-functional requirements between vendors and users.

- **In each vendor**
  - Reflect the standards in requirements definition documents.
Fujitsu’s practice:
“Four Innovations”
in
System Development
“Four Innovations” in System Development

**Design**
- Guidelines for RDDs *
- Internal audit of RDDs
- Industry-wide initiatives for improving RDDs
- Cultivating Business Architects

**Production**
- Templates for system development
- Industrialization
- Offshore development

**Maintenance**
- Service templates

**System architecture**

**Building/testing**

**Operation/maintenance**

**Way of working for system engineers**
- TPS-based HR development, small group activities

*RDD: Requirement Definition Document*
Improvement of the quality of planning and mandatory review by a third party within Fujitsu

- Guidelines for RDDs*
- Internal Audit of RDDs
- Diagnosis of external specification

Human development

- Cultivate Business Architects who support planning, requirements building and developing processes.

*RDD: Requirement Definition Document
Mandatory review of the RDDs* of system integration exceeding certain size by third party within Fujitsu

* RDD: Requirement Definition Document
An example of Internal audit of RDDs

Aggregate Check

Consistency Check

Compatibility Check

Environment

Job transaction

System performance

Interface

Data

Non-functional requirement B

Non-functional requirement A

Interaction

In the operation requirements

Between operations and Non-functional requirements

Between Functional and Non-functional requirements

In Non-functional requirements

In Functional requirements

Non-functional requirement A

Non-functional requirement B

Environment

Job transaction

System performance

Interface

Data

Interaction
Wrap up ~To Ensure Reliability
To Ensure Reliability

Improvement of the quality from two aspects

Industrial activity
- Clarification of requirements by Common Views (Measures)
- Adopt industrial standards

Internal practice
- Improvement of technologies by “Four Innovations”
- Provide internal Know-how

Reliability of Information Systems
THE POSSIBILITIES ARE INFINITE