# Liiketoimintajohteinen vaatimusten hallinta:

## kilpailuetua ydinkyvykkyydellä
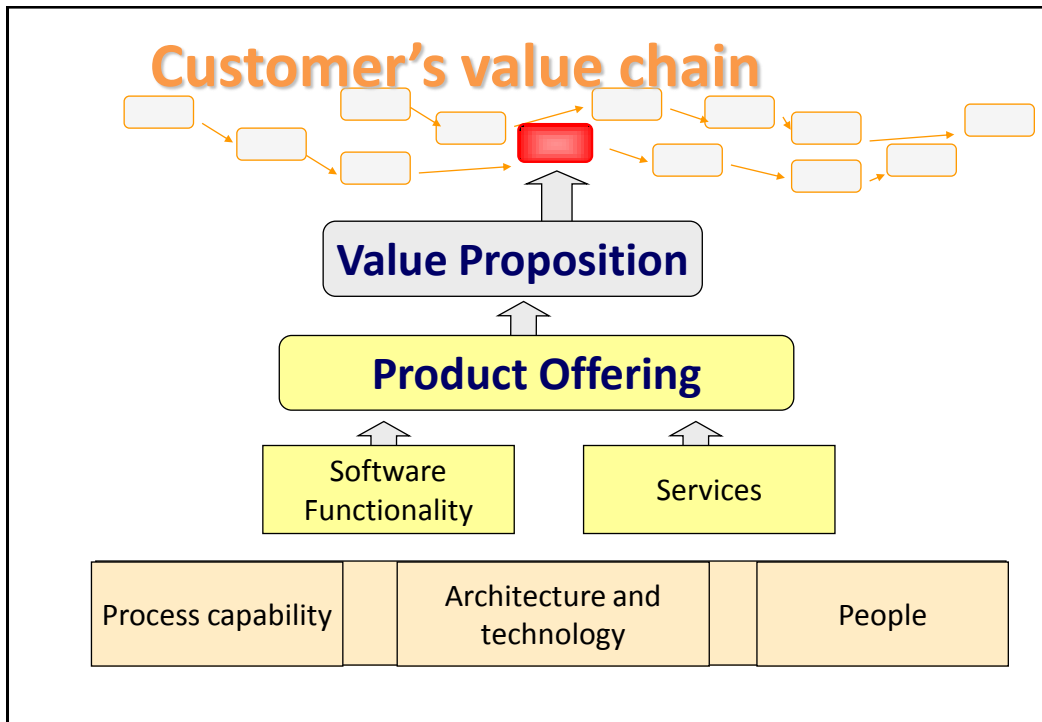
Jyrki Kontio, Ph.D.

R & D-Ware Oy

www.rdware.com

© Jyrki Kontio, R & D-Ware Oy · 20/01/2009 · 1

---

# Presenter Background

- Principal Consultant and Founder of R & D-Ware Oy
- Board member at
  - QPR Software Oyj
  - Webropol Oy
  - Tietotekniikan Liitto
  - Ohjelmistoyrittäjät ry
- Professor of Software Product Business @ Helsinki University of Technology, 2002 – 2007
- Nokia, 1986 – 2002
  - Knowledge-based systems research and consulting at Research Center (1986-92)
  - Manager of the software engineering research group at Research Center (1992-94)
  - Quality manager at a business unit (1997-99)
  - Senior manager at Nokia Networks: process management (1999-2000)
  - Principal Scientist at Nokia Research Center, software capability (2001-02)
- Other experience
  - Acting (part-time) professor of Software Engineering at Helsinki University of Technology (1997-2000)
  - Senior researcher at University of Maryland in professor Basili's research group (1994-96)
  - Software development and management in software houses and corporations (1982-1986)

© Jyrki Kontio, R & D-Ware Oy · 20/01/2009 · 2

## Customer's value chain

**Value Proposition**

**Product Offering**

Software Functionality

Services

| Process capability | Architecture and technology | People |
|---|---|---|

---

## Arvolupaus

- Arvolupaus (value proposition) kuvaa asiakkaan näkökulmasta sen, mitä lisäarvoa yrityksen tarjooma tuottaa asiakkaalle ja miten se syntyy
- Esim.
  - "Parannamme asiakkaan T&K-toiminnan kilpailukykyä tunnistamalla asiakkaan liiketoiminnan kannalta keskeiset T&K-kyvykkyydet ja kehittämällä niistä kilpailuetuja"
  - "Tietoturvaratkaisumme lisää operaattorin lisäarvoa asiakkailleen, vähentää ongelmatilanteita ja tuottaa lisämyyntiä"

# R & D-Ware Oy:n arvolupaus

Tunnistamme liiketoiminnan kannalta keskeiset ohjelmistokyvykkyydet ja kehitämme niistä pitkäkestoisia kilpailuetuja asiakkaillemme.

Osaamisemme perustuu

- vahvaan käytännön kokemukseen,
- syvälliseen <u>ohjelmistoteknologian</u> ja <u>ohjelmistoliiketoiminnan</u> tuntemukseen sekä
- maailmanlaajuiseen yhteistyöverkostoon.

# Kilpailukyky, laatu ja business

- Asiakas on valmis maksamaan lisäarvoa tuottavasta laadusta = "hyötymalli"
- Asiakkaan hyötymalli muuttuu ja elää
  - ➔ Ymmärrä asiakkaan hyötymalli
  - ➔ Tarjoa asiakkaalle tuote, joka vastaa hyvin hyötymallin vaatimuksia
  - ➔ Ymmärrä ja määritä yrityksesi ydinkyvykkyydet
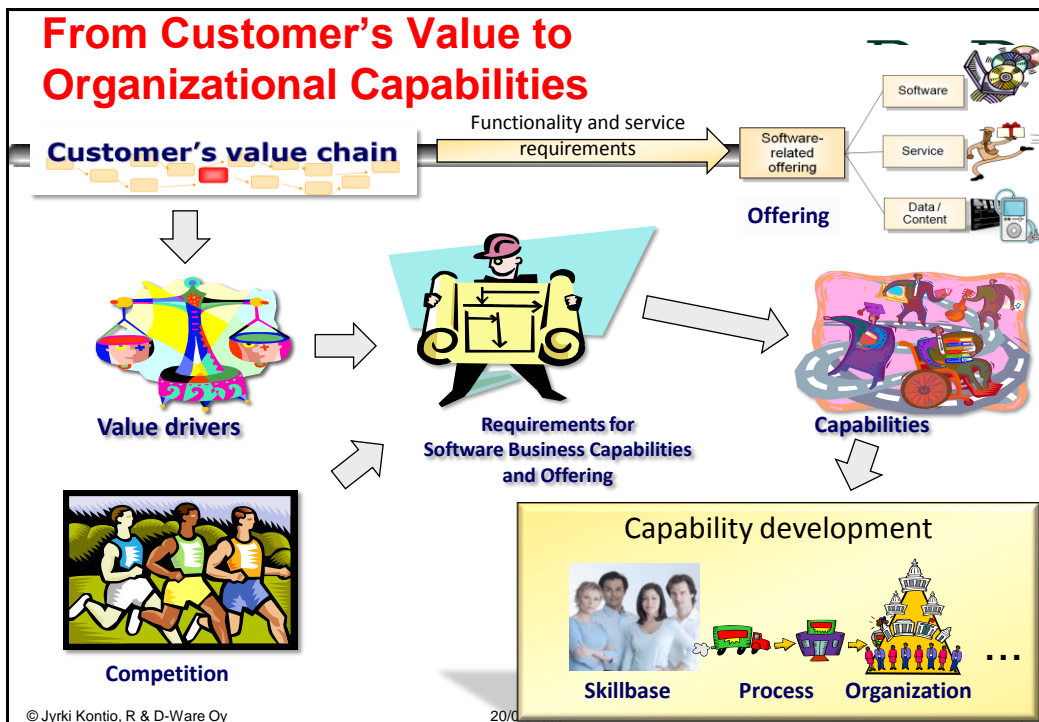  - ➔ Kehitä prosesseihisi kyky ohjata laatua

# Traditional View of Software Capabilities

- Predifined and common practices determine organization's software development capabilities
  - ◆ CMMI, SPICE, ISO 9001
- They do not account for business and firm-specific aspects very well

| Maturity Level | Key Process Areas |
|---|---|
| 5. Optimizing | • Process Change Management<br>• Technology Change Management<br>• Defect prevention |
| 4. Managed | • Software Quality Management<br>• Quantitative Process Management |
| 3. Defined | • Peer reviews<br>• Intergroup coordination<br>• Software product engineering<br>• Integrated software management<br>• Training program<br>• Organization process definition<br>• Organization process focus |
| 2. Repeatable | • Software configuration management<br>• Software quality assurance<br>• Software subcontract management<br>• Software project tracking and oversight<br>• Software project planning<br>• Requirements management |
| 1. Initial | Initial level, no KPAs, unpredictable and poorly controlled projects |

---

# From Customer's Value to Organizational Capabilities



**Customer's value chain**

Functionality and service requirements

Software-related offering

Software

Service

Data / Content

**Offering**

**Value drivers**

**Requirements for Software Business Capabilities and Offering**

**Capabilities**

**Competition**

Capability development

**Skillbase**     **Process**     **Organization**

# Core Competence

- A core competency is something that a firm can do well:
  - ◆ It provides customer benefits
  - ◆ It is hard for competitors to imitate
  - ◆ It can be leveraged widely to many products and markets.
- Examples:
  - ◆ Volvo's safety engineering
  - ◆ Honda's excellenci in engine design and manufacturing
  - ◆ Nokia's manufacturing and logistics chain

Hamel and Prahalad (1990)

# Software Business Capability

- Software Business Capability refers to *organization's ability to create and maintain competitive software-based offering and business*
- Software capabilities are based on
  - ◆ Personnel and their skills
  - ◆ Processes
  - ◆ Tools
  - ◆ Software assets
  - ◆ Technology and architecture
  - ◆ Management system
  - ◆ Organizational knowledge – tacit and explicit
- **Core software business capabilities** are those that create **sustainable competitive advantage** for the organization in its business

# Resource-based View of Competitive Advantage, VRIN

R&D WARE

- Sustained competitive advantage can be obtained when an organization's resources are
  - **Valuable**
    - When they create value, i.e., improve productivity, quality, margins, market-share, etc.
  - **Rare**
    - When they are not easily obtainable.
  - **Imperfectly imitable**
    - When they are difficult to copy.
  - **Non-substitutable**
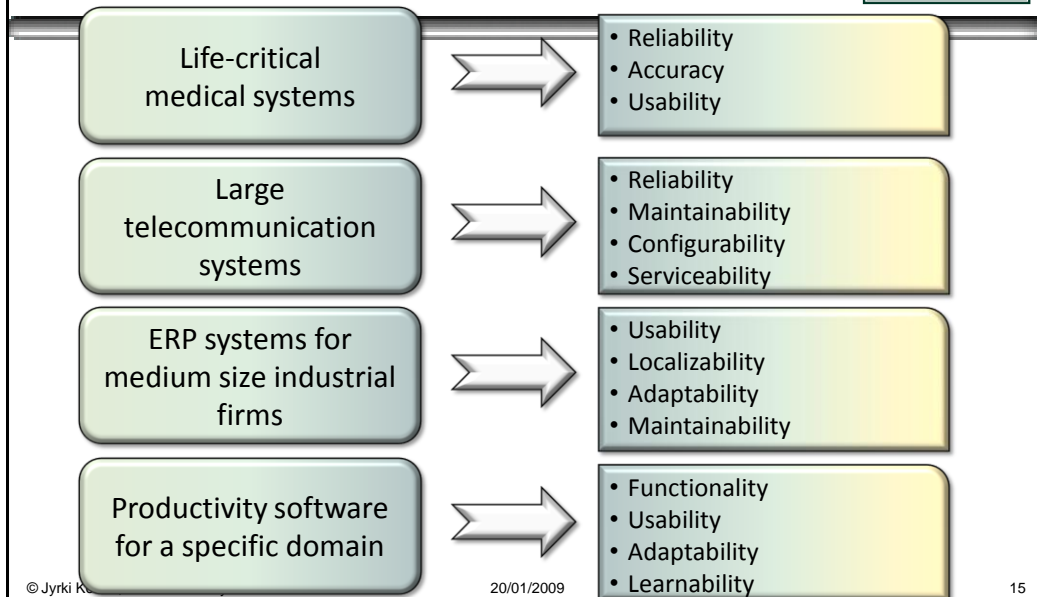    - When they cannot be replaced or compensated by some other resources.

Barney, 1991

---

# Impacts of Different Process Changes to Competency Characteristics

R&D WARE

| | Traditional quality system | Agile (SCRUM) | Formal inspections | Reusable SW assets |
|---|---|---|---|---|
| Speed of development | | | | |
| Software reliability | | | | |
| Flexibility of development | | | | |
| Cost of development | | | | |
| Maintainability | | | | |
| Predictability | | | | |
| Total cost of ownership | | | | |

## Examples of Common Business Requirements for Software Capability

| | |
|---|---|
| Life-critical medical systems | • Reliability<br>• Accuracy<br>• Usability |
| Large telecommunication systems | • Reliability<br>• Maintainability<br>• Configurability<br>• Serviceability |
| ERP systems for medium size industrial firms | • Usability<br>• Localizability<br>• Adaptability<br>• Maintainability |
| Productivity software for a specific domain | • Functionality<br>• Usability<br>• Adaptability<br>• Learnability |

© Jyrki K...                                    20/01/2009                    15

---

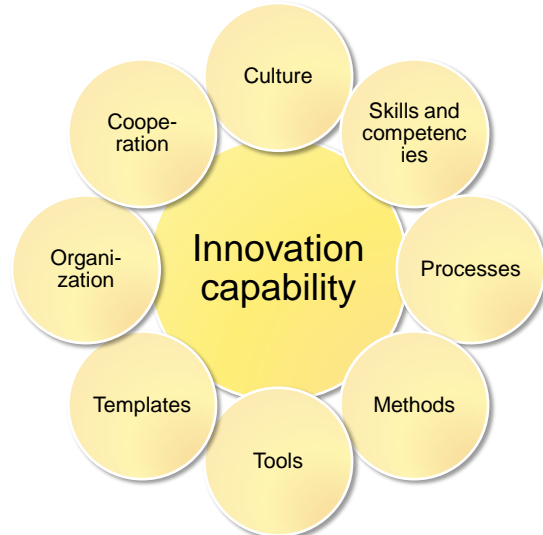## Requirements Engineering as a Core Competence

- Understanding of <u>customer needs</u> is fundamental to providing attractice solutions to customer

- <u>Innovation is not limited to technology</u>, leading innovations involve processes, business models, delivery channel, cooperation models, ...

- <u>Ability to innovate</u> attractive solutions for customers can a sustainable competitive advantage

- Requires *comprehensive innovation capability*

© Jyrki Kontio, R & D-Ware Oy                  20/01/2009                    17

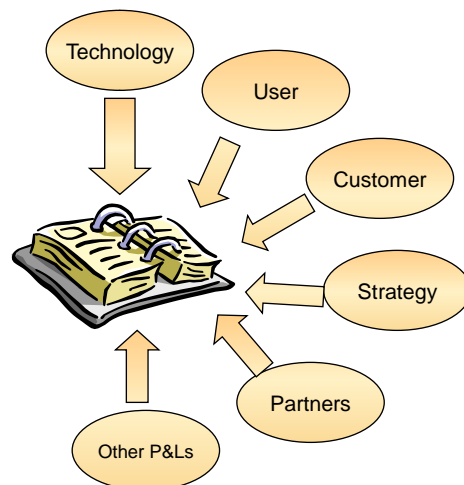20/01/2009                                                                   7

# Comprehensive Innovation Capability

Comprehensive
Innovation Capability =

Key aspects necessary for innovation are developed and sustained systematically



Culture

Skills and competencies

Coope-ration

Organi-zation

Innovation capability

Processes

Templates

Methods

Tools

# From Technical Specification to Stakeholder Value

- Traditional technology-driven requirement specification has been replaced by **stakeholder-driven value discovery**
- Separation of user vs. customer
- Other stakeholders often provide important requirements



Technology

User

Customer

Strategy

Partners

Other P&Ls

## Key RE Terms

*Need* (tarve)
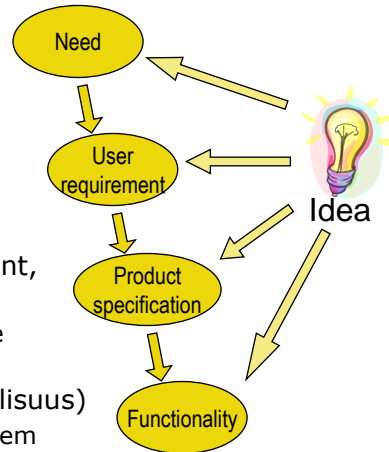- ◆ Problem or expectation to be solved or satisfied

*Requirement* (vaatimus)
- ◆ Desciption of a specific **need** that will be addressed by the system; described from user perspective (what the user/customer can accomplish)

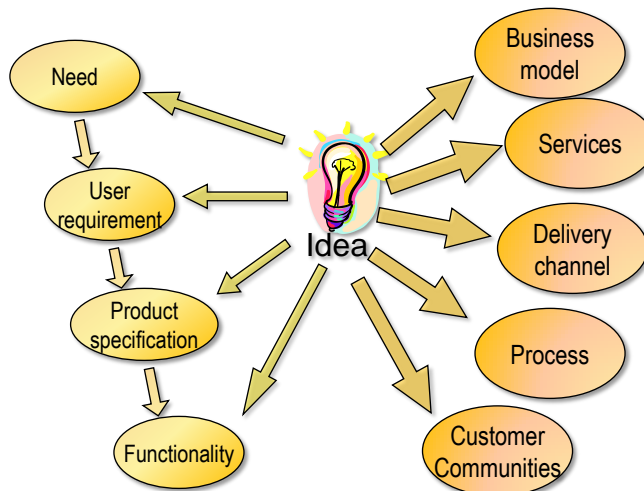**Product specification** (system requirement, tuotevaatimus)
- ◆ Description of how the **requirement** will be addressed by the system

**Functionality** (feature/function, toiminnallisuus)
- ◆ Implemented feature or function in the system (implemented **requirement** or **specification**)

## Innovation Scope

# Requirements Engineering State-of-Practice

- Few organizations use systematic methods or tools
- Requirements traceability is seldom possible
- Changes in requirements are seldom controlled and seldom updated to original documents
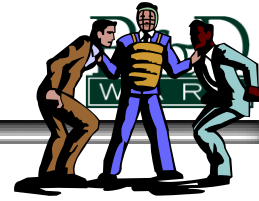
# Requirements Engineering

Requirements engineering
- ◆ "… process that elicits, analyses and models requirements"
  - Requirements elicitation
    - capturing and identification of requirements
  - Requirements analysis
    - understanding and prioritization of requirements
  - Requirements specification
    - representing (documenting) requirements

Requirements management
- ◆ Managing the changes in requirements

# Product Decisions

Product decisions are

- What product should be developed?
- What functionality should it contain?
- When should we start?
- How much time does it take?
- How much is it going to cost?
- Can we do it?

Challenges

- There is not enough information available when decisions are made
- Decisions are complex
- Many parties are affected
- Sales people have incentives to promise more than can be delivered
- R&D has incentives to commit to as little as possible

Possible solution: "Product Decision Board"

---

# Product Decision Board

- A systematic way of preparing and making the required product decisions
- All stakeholders are involved
- Sufficient planning and preparation
- Roadmaps provide long-term visibility

*If the process works well, the meetings are short, if preparations are poor, not even long meetings will remedy the problems*

## RE as a Competitive Asset: How to Get Started

R&D
WARE

- Understand your customers' value chain
- Define your business drivers
- Determine the business requirements for your organization's capabilities
- Set requirements for innovation capability
- Implement requirements engineering improvements towards the goals
  - ◆ See the big picture, develop the comprehensive capability

## Questions?

R&D
WARE

**Further information:**

**www.rdware.com**

**www.jyrkikontio.fi**