

# Software Capability

Source of long-term competitive advantage –  
Investor perspective

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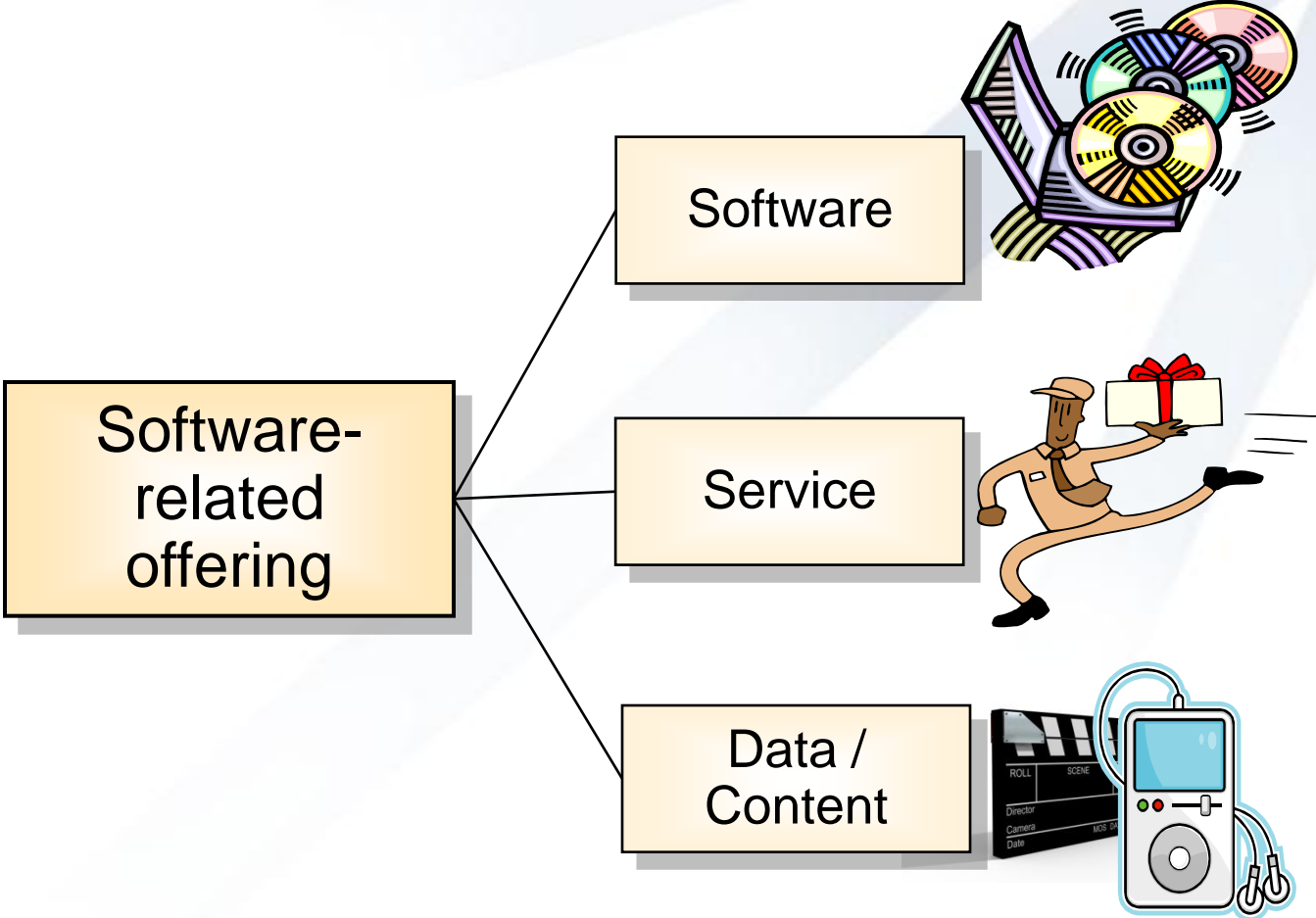
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- *Mitä on ohjelmistokyvykkyys?*
- *Mikä on sen merkitys liiketoiminnalle?*
- *Miten sitä kehitetään?*
- *Esimerkki-caset*
  
- *Ohjelmistokyvykkyys investoijan/  
pääomasijoittajan näkökulmasta*

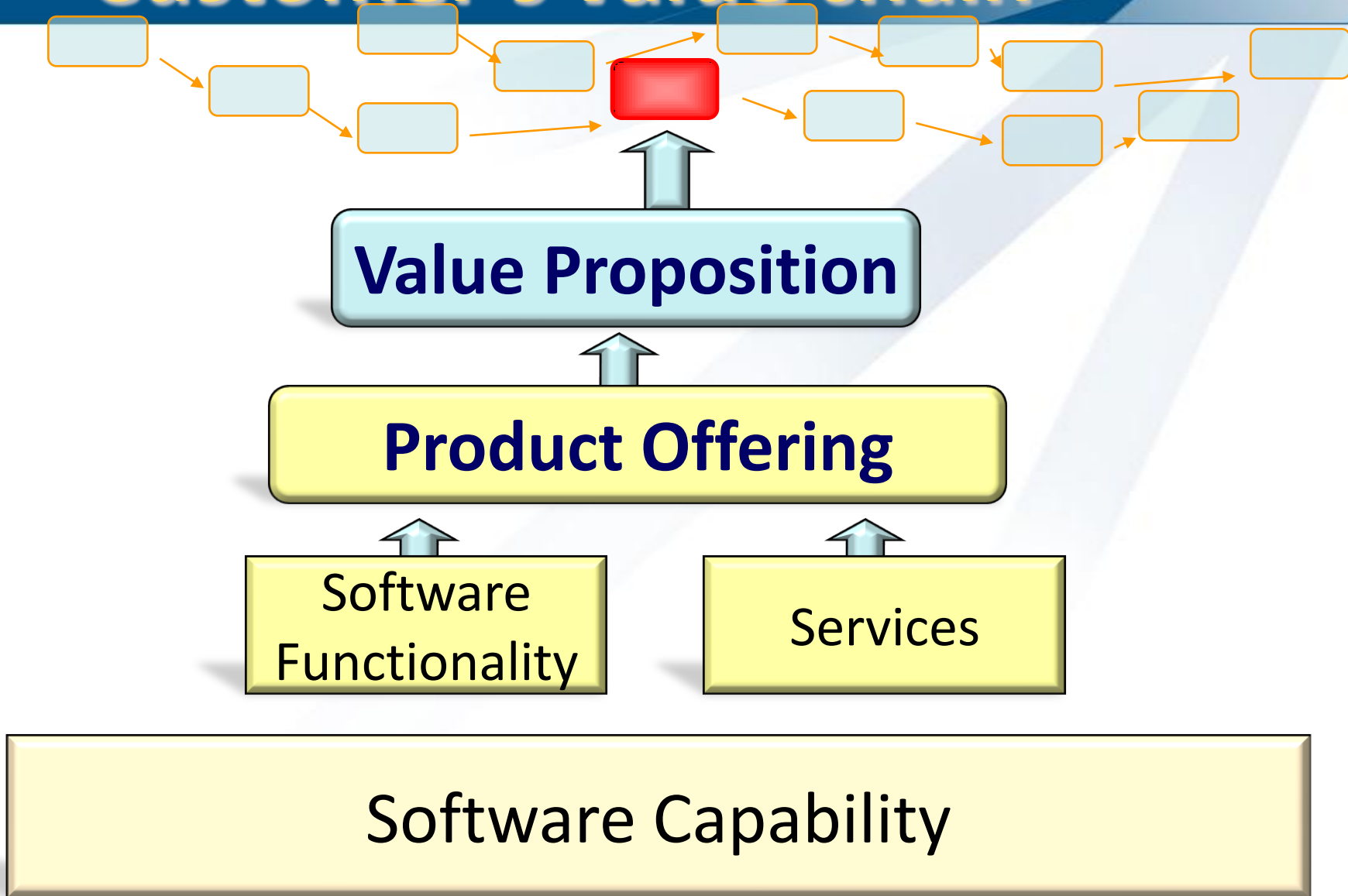
# Trends in Software Business

- Softwarization – “ohjelmistoituminen”
  - *Services (and functionality in traditional products) are being increasingly offered through software*
- Servicization – “palvelullistuminen”
  - *Software functionality is increasingly offered as a “service”*
- Productization – “tuotteistuminen”
  - *Both software and services are being “productized” for efficiency and profitability*
- Componentization – “komponentointuminen”
  - *Components are increasingly used as building blocks of systems*
- Communization – “yhteisöllistyminen”
  - *User communities are involved in the development of software*
- Contentization – “sisällöllistyminen”
  - *User communities are involved in the development of software*

# Software-related Offering



# Customer's value chain



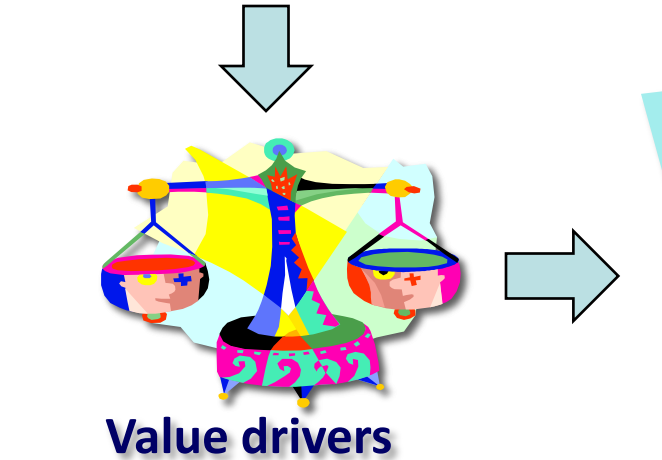
# Traditional View of Software Capabilities

- ▶ Predefined 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

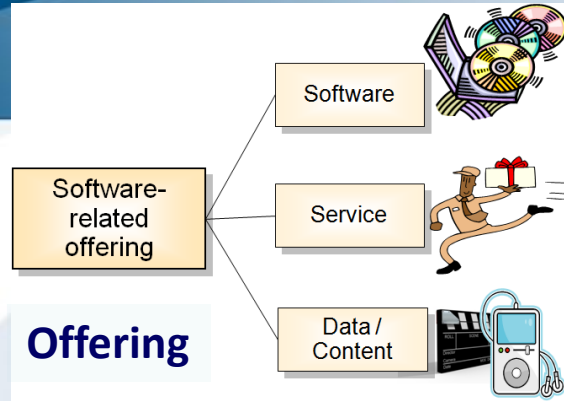
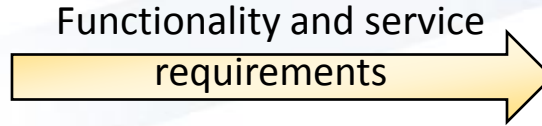
Maturity Level	Key Process Areas
5. Optimizing	<ul style="list-style-type: none"><li>• Process Change Management</li><li>• Technology Change Management</li><li>• Defect prevention</li></ul>
4. Managed	<ul style="list-style-type: none"><li>• Software Quality Management</li><li>• Quantitative Process Management</li></ul>
3. Defined	<ul style="list-style-type: none"><li>• Peer reviews</li><li>• Intergroup coordination</li><li>• Software product engineering</li><li>• Integrated software management</li><li>• Training program</li><li>• Organization process definition</li><li>• Organization process focus</li></ul>
2. Repeatable	<ul style="list-style-type: none"><li>• Software configuration management</li><li>• Software quality assurance</li><li>• Software subcontract management</li><li>• Software project tracking and oversight</li><li>• Software project planning</li><li>• Requirements management</li></ul>
1. Initial	Initial level, no KPAs, unpredictable and poorly controlled projects

# From Customer's Value to Organizational Capabilities

## Customer's value chain



Competition



Capabilities



# Software Capability

- ▶ Software capability refers to ***organization's ability to develop competitive software-based offering***
- ▶ 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 capabilities** are those that create **sustainable competitive advantage** for the organization in its business



# Resource-based View of Competitive Advantage, VRIN

- ▶ 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

# Software Capability Requirements

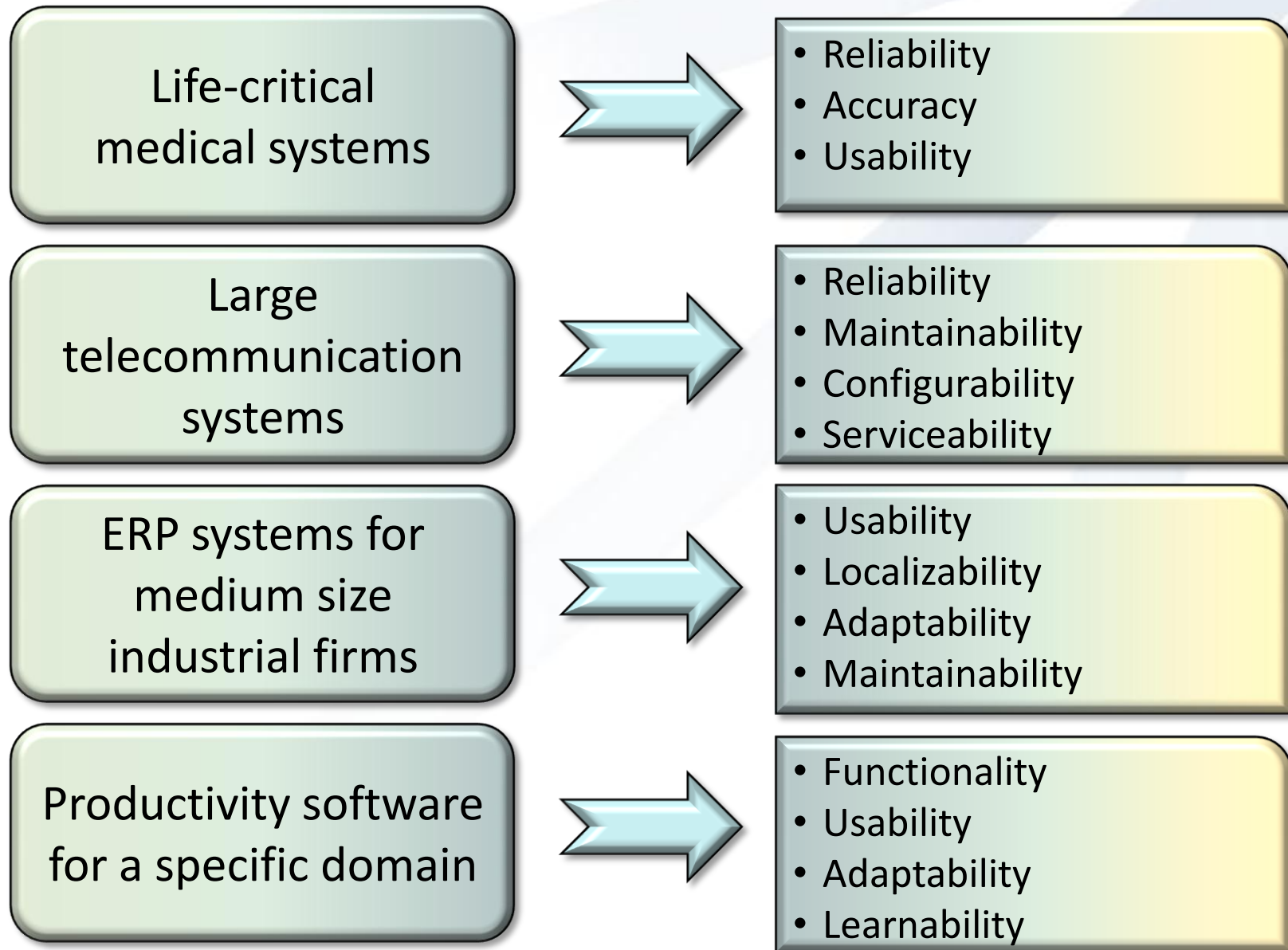
## ▶ Examples

- ▶ Speed of development
  - ▶ That is in sync with the customer's release plan
- ▶ Software quality
  - ▶ That meets the specific requirements of the medical domain (FDA)
- ▶ Flexibility of development
  - ▶ That allows us to add 20% of requirements up to one month before deployment
- ▶ Cost of development
- ▶ Maintainability
- ▶ Predictability
- ▶ ...

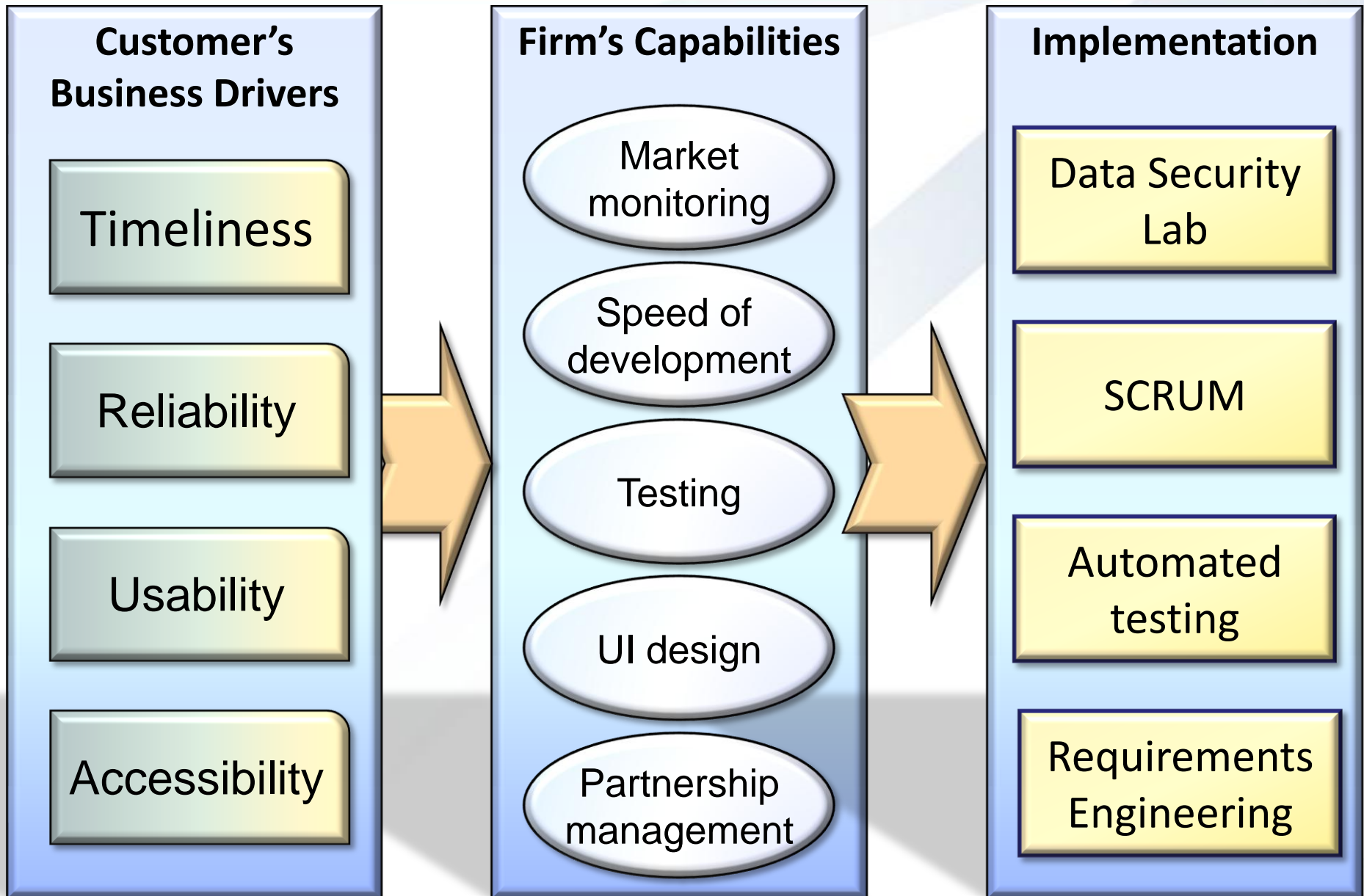
# Impacts of Different Process Changes to Competency Characteristics

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

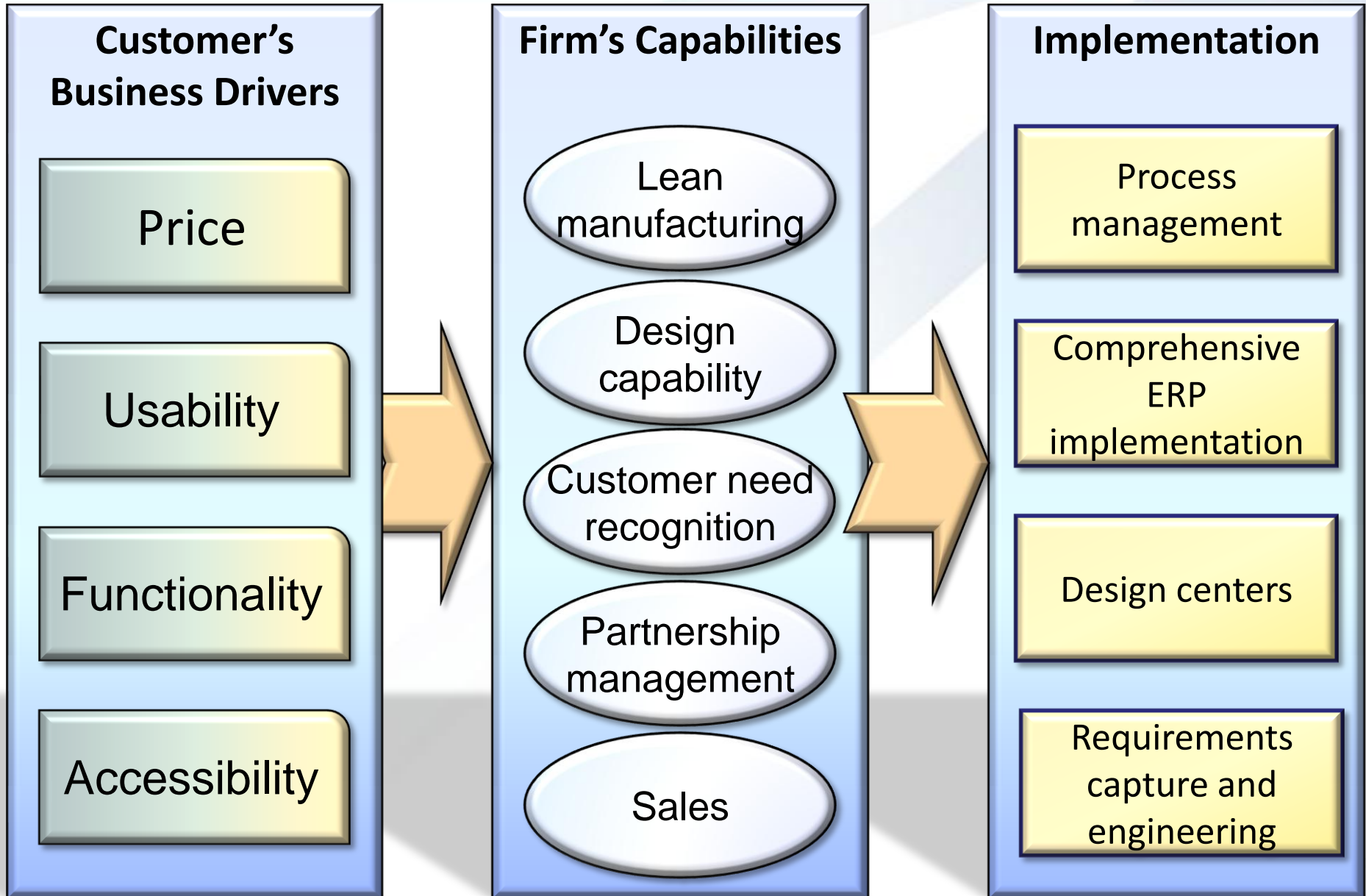
# Examples of Common Business Requirements for Software Capability



# Case: F-Secure Oyj



# Case: Nokia Oyj



# Key Questions for Investor

- ▶ Does the firm know what are the value drivers for their customers?
- ▶ Do they know what they require from business and R&D?
  - ▶ What are they?
- ▶ What specific actions have they implemented to develop their capabilities?
- ▶ What are the core capabilities of the firm?
- ▶ How do the core capabilities differ from those of the competition?
- ▶ What evidence can they provide about their improvement in capabilities?

# Conclusions

- ▶ R&D capabilities are essential in high technology firms
- ▶ Short-term alignment of *capabilities* and customer *value drivers* creates growth and profitability
- ▶ Continuous development of *core capabilities* creates sustainable **competitive advantages**
- ▶ The **capability alignment** and **core capabilities** of medium and large companies should be assessed when making investments



# Further Information

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