

# Implementing agility in the manufacturing industry – a management approach

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Dipl.-Ing. Christian Rabitsch  
Scientific Assistant

Graz University of Technology  
Institute of Production Science and Management  
8010 Graz, Inffeldgasse 11/I

Tel.: +43 316 873 9541

Mail: [christian.rabitsch@tugraz.at](mailto:christian.rabitsch@tugraz.at)

# Manufacturing companies have to deal with an increasingly volatile and uncertain market environment



- Current trends in the automotive industry as an illustrative example
  - **Volatile market environment** makes accurate forecasts increasingly difficult
  - OEMs: high development costs<sup>1</sup>, too expensive production facilities<sup>2</sup> and margin pressure<sup>3</sup>
    - additional **cost reduction programs** installed
  - Model offensives, more derivatives, shorter product lifecycle, customization<sup>4</sup>
    - **increasing complexity during production**
  - Technology-(r)evolution in drivetrain, driver assistance systems and connectivity; however, some technology roadmaps are far from being clear<sup>3</sup>
    - **increasing uncertainty**
- Period of constant change has arrived
  - Most of these trends not fundamentally new; however, **magnitude of impact on industry** is expected to **increase significantly**<sup>3</sup>
  - Capability to **adapt business- and operations-model to these changes** has become more important than ever before

**Norbert Reithofer, CEO BMW**<sup>5</sup>

„I don't know what will happen in 2013. At a time of extremes, predictions have become impossible.“

→ transform BMW into an extremely flexible organism

**Wolfgang Reitzle, Ex-CEO Linde**<sup>5</sup>

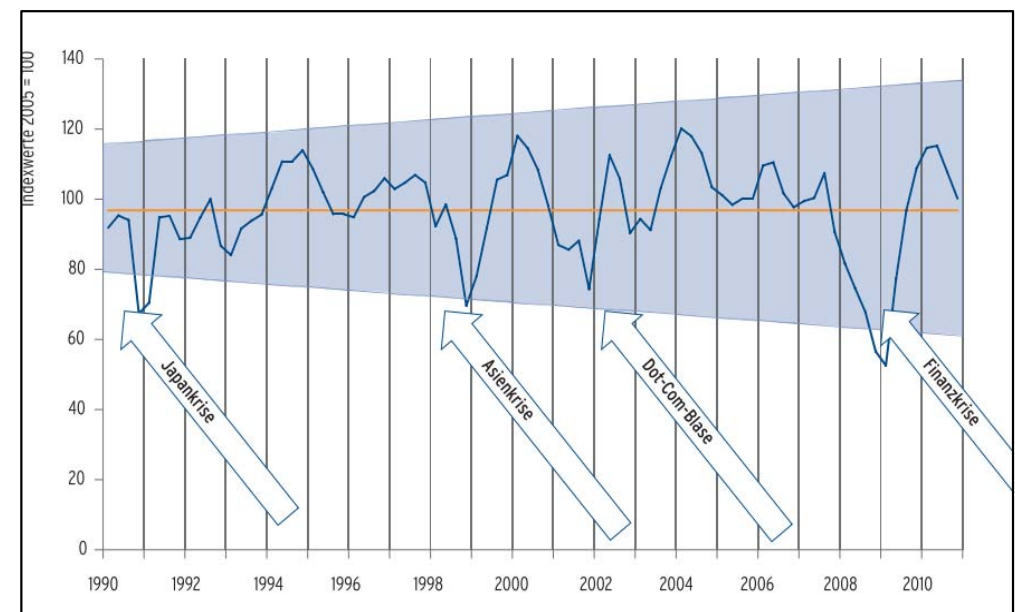
„It has never been more difficult than today to give a precise prediction of future economic development.“

→ build a High Performance Organization

**Jeff Immelt, CEO General Electric**<sup>6</sup>

„The global economy is uncertain, and we are prepared for a variety of economic outcomes“

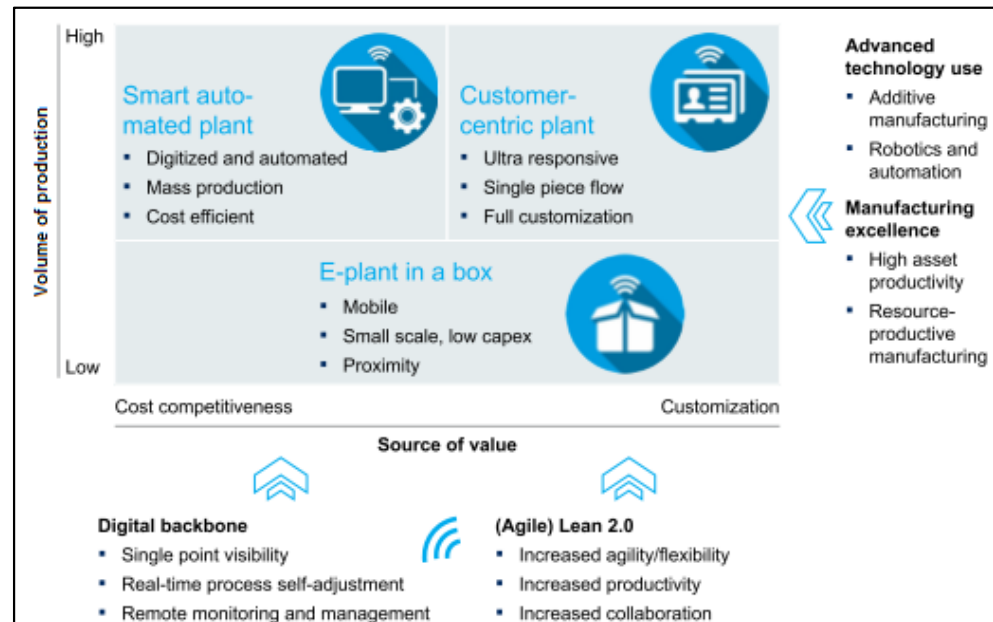
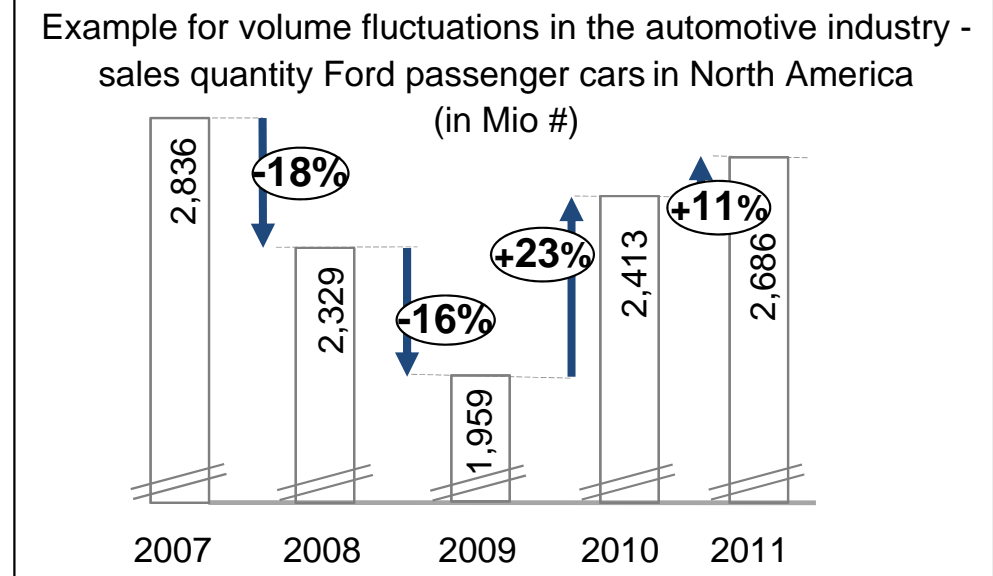
→ global diversity, service growth and e-Business transformation reduce sensitivity to business cycle



ifo Weltwirtschaftsklima<sup>4</sup>

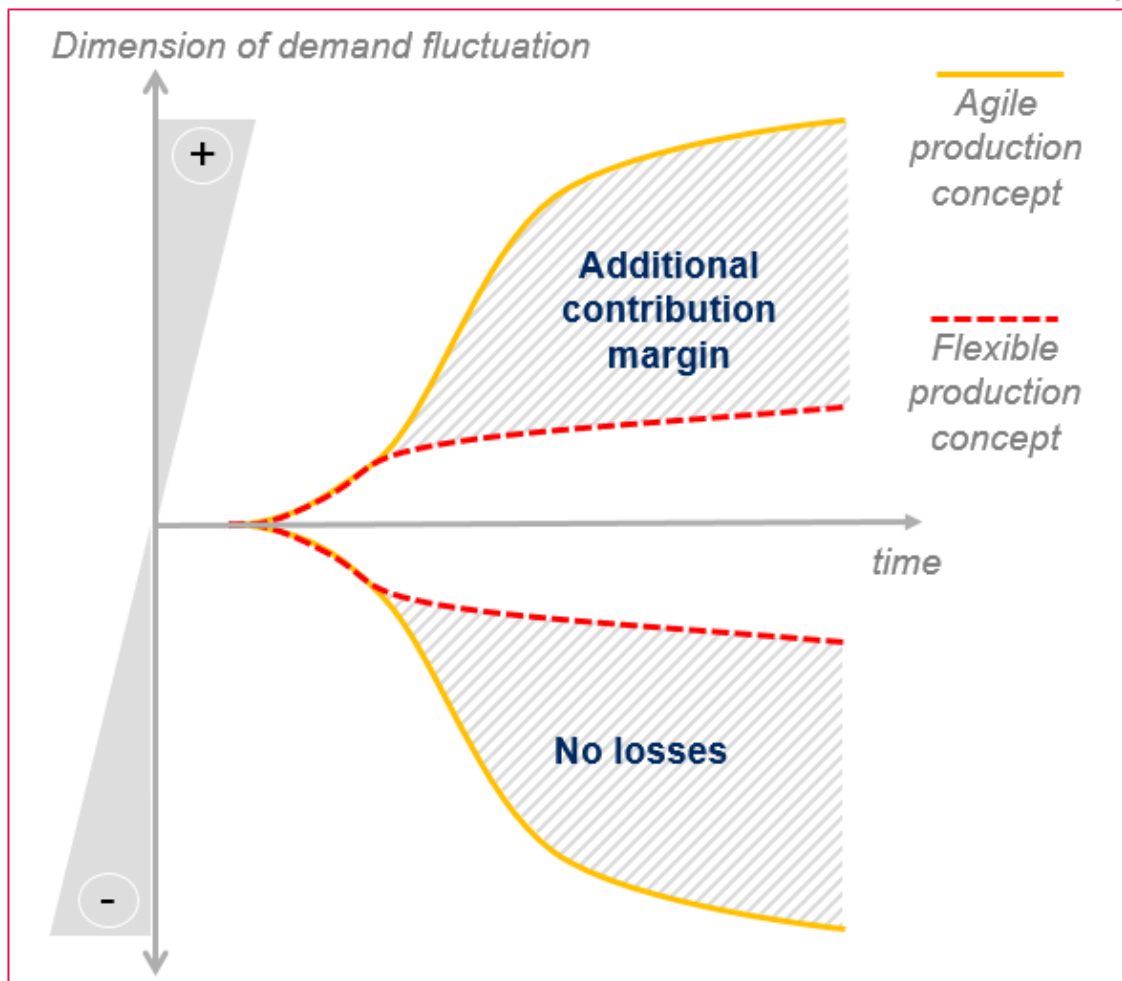
# “Incorporating agility” is the overall goal of a research project with an Austrian contract manufacturer in the automotive industry

- The overall challenges for automotive suppliers <sup>3</sup> ...
  - Volatility leads to increasing number of **both opportunities and risks**
  - Further **efficiency gains** necessary **without limiting flexibility** to quickly adjust to uncertain market developments
- ... lead to challenges of the considered contract manufacturer
  - **Volume fluctuations** as the major change driver
  - **Balancing act** between **opposed goals**
    - Customization drives complexity
    - Rapid adaption to customer requirements
    - Cost efficiency for competitiveness
- Goals of the research project
  - **Improve ability to (re)-act** in situations where prediction is difficult
  - Improve ability to **adjust production output to customer demand** optimally
- **Agility** is the answer to thrive in such a challenging environment



Sources: 3 Roland Berger (2014); 7 McKinsey (2015)

# Agility allows to mitigate risks and capture opportunities for superior success in a volatile environment

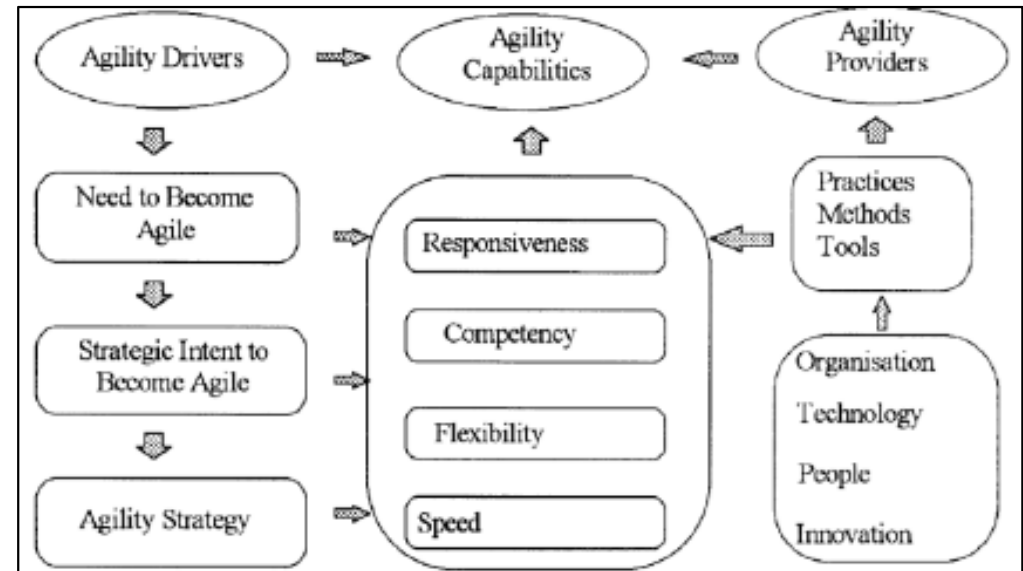


Conceptual illustration of agility in manufacturing <sup>8</sup>

- Definition  
**Agility** enables companies to **prepare proactively** for uncertainties and **react quickly** to changes to **optimize the economic situation** (e.g. EBIT, ROI, market share, ...) by leveraging the whole value chain. <sup>8</sup>
- Other concepts  
Transformability and flexibility are integral parts of our understanding of agility.

# So far, agility and its coverage in academic literature lacks practical applicability

- Critique on available agility approaches
  - Very conceptual
  - Not practically applicable on an operational level
  - Based on concepts no applicable approaches have been developed – **not possible to apply in an organization**
- Agility has previously only been discussed from a conceptual point of view
  - transition of these concepts to a **practicable approach has not been sufficiently discussed** yet
- Many best-practice examples available how agility is present in a business environment
  - Collected in hindsight
  - Focus on a single point in the overall picture
  - **Show benefits of agility, but not how to get there**



Conceptual model to achieve agility in manufacturing organizations <sup>9</sup>

Nikon, in 1994, entered the high-profit, rapidly expanding market for premium nonprescription sunglasses, products with retail prices of \$50 to \$250. Its strategy was a form of "sneakerization": transforming a mass-produced, low-priced, low-margin commodity to a high priced, high-profit, high-production-volume specialty product. Nikon offers more than 30 frame styles in five lens types keyed to the distinctive sun-protection requirements of five different sport activities: shooting, flying, dishing and water sports, hiking and skiing.

Illustrates: fragmentation of markets, customer-enrichment-based product design and pricing, mass individualization

Best-practice-example for agility <sup>10</sup>

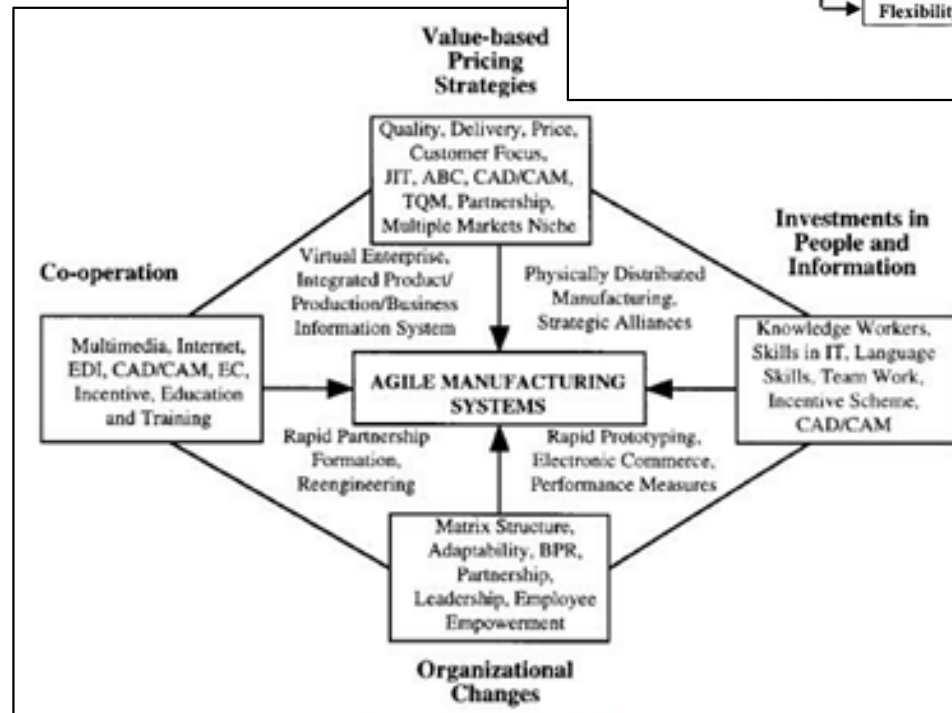
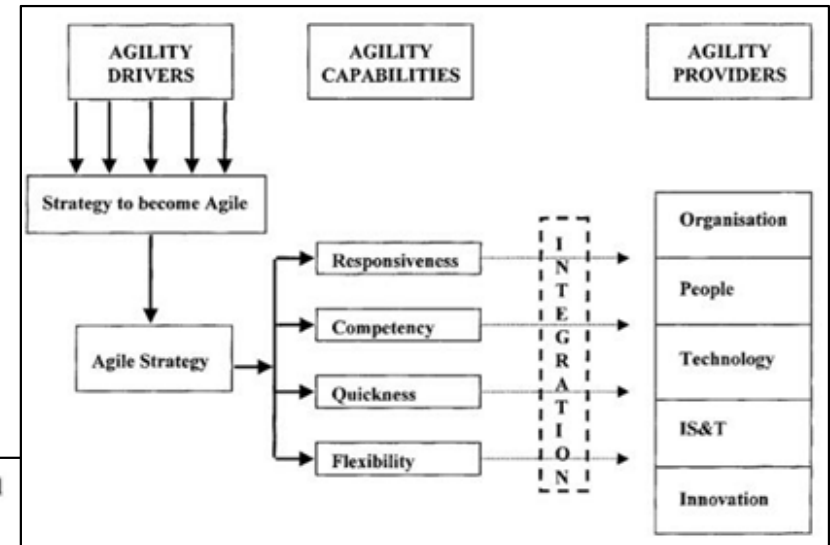
Sources: 9 Sharifi, Zhang (1999); 10 Goldman, Nagel, Preiss (1995)

# Research gap – there is no management approach available that links the conceptual with the operational view

## current research achievements



agility models in academic literature  
selected examples:



Sources: Sharifi et al. (2001); Gunasekaran (1998)

# Research gap – there is no management approach available that links the conceptual with the operational view

## current research achievements



### best practice examples

Nikon transformed mass-produced, low-priced, low-margin commodity glasses to a high priced, high-profit, high-production-volume specialty product. Nikon offers more than 30 frame styles in five lens types keyed to the distinctive sun-protection requirements of different user groups.

Illustrates: **fragmentation of markets, customer-enrichment-based product design and pricing, mass individualization**

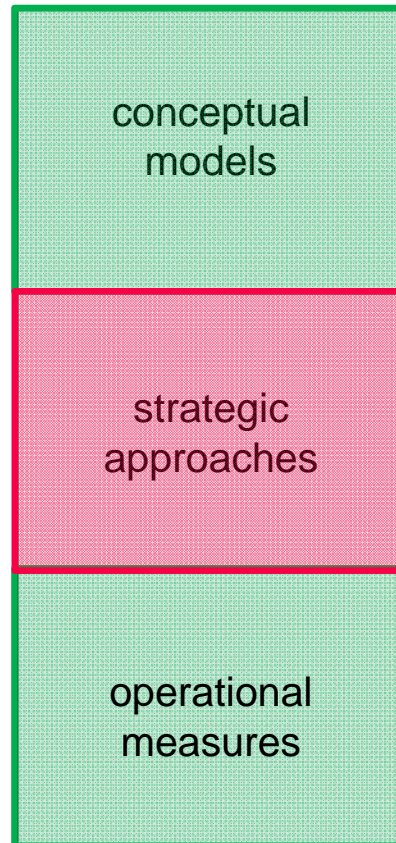
### individual agility measures - examples

To **hedge schedule risk**, BuS quotes 2 weeks for order delivery, although production is often completed within 1 week. Moreover, it keeps up to **20% of its facilities idle**, which builds in add flexibility.

**products are designed** to simplify the assembly process and **reduce labor inputs**. The **design team** is highly motivated to streamline, because members reap the efficiency benefits through a **profit-sharing scheme**.

# Research gap – there is no management approach available that links the conceptual with the operational view

current research achievements



agility models in  
academic literature

research gap

best practice examples

individual agility measures

**Self-set requirements for the management approach to be developed:**

- Step-by-step process
- Holistic view of the company
- Applicable in industrial practice

# The identified research gap leads to the following research-leading questions

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**Working title of the thesis:**

**Implementing agility in the manufacturing industry – a management approach**

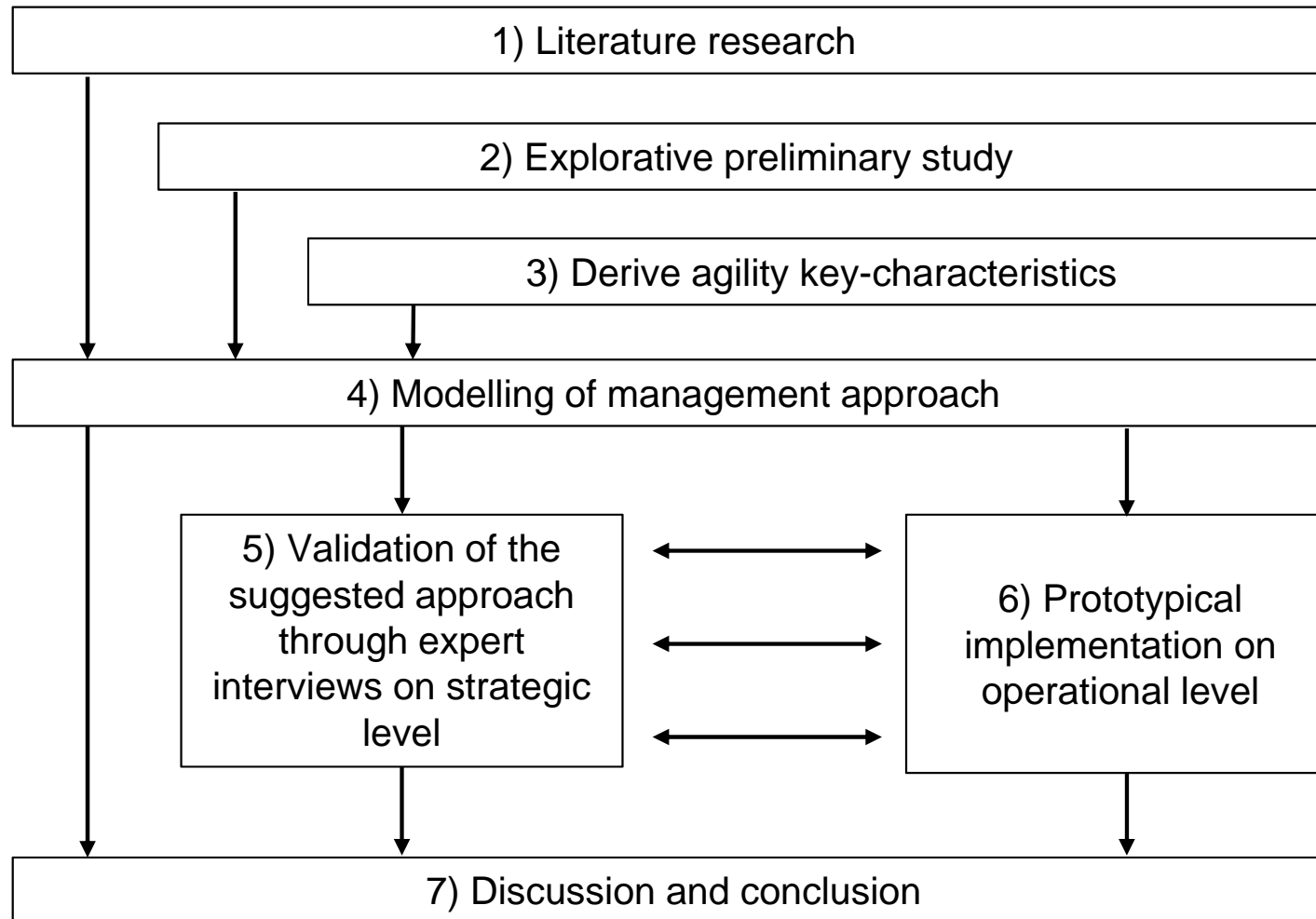
## **1. What does agility mean for a manufacturing company?**

- a. Which volatilities and uncertainties are relevant for manufacturing companies using the automotive industry as an example?
- b. What are the core characteristics of agility that have to be addressed when implementing agility in a manufacturing company?

## **2. How can agility be achieved for a manufacturing company?**

- a. How does a management approach to achieve agility for a manufacturing company look like?
- b. What specific measures have to be taken to increase a manufacturing company's agility?
- c. How can a company choose the appropriate measures?

# Planned research activities follow the basic scientific finding process: inductive – deductive – inductive <sup>11</sup>



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8010 Graz, Inffeldgasse 11/I

Tel.: +43 316 873 9541

Mail: [christian.rabitsch@tugraz.at](mailto:christian.rabitsch@tugraz.at)