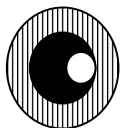


Guidebook Implementation of Additive Manufacturing Processes / 3D Printing

Part selection, profitability calculation, investment, factory and personnel planning

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2. Edition 2020

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at <http://dnb.dnb.de>

Wildemann, Horst

Guidebook Implementation of Additive Manufacturing Processes / 3D Printing

ISBN 978-3-947730-07-0

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Preamble

Additive manufacturing processes / 3D printing have increased in popularity in research and industry in the past years due to their characteristics. A large number of companies are advertising with examples of successfully additively manufactured components. Here, especially the advantages of additive manufacturing processes as well as the parts manufactured through them are emphasized.

The advantages of additive manufacturing processes paired with enticing growth forecasts for the future market for additive manufacturing are attracting the interest of many companies. The constraints for the development of additive manufacturing as well as the current impediments to this process are not communicated as intensely as the advantages that are achievable through additive manufacturing.

This guidebook is a practical aid for the introduction of additive manufacturing processes. It outlines several different methods for the analysis of one's own product portfolio, the evaluation of economic efficiency of additive processes as well as the planning of the development of an additive manufacturing unit or factory.

The purpose of this guidebook is to ...

- ... offer a comprehensive overview of the additive manufacturing technologies and their application potential.
- ... offer a tried-and-tested guide for companies for the implementation of additive manufacturing processes under proprietary constraints.
- ... show the potential impact of additive manufacturing processes through case studies.

Content

| | |
|----------|---|
| 1 | Trends, deficiencies and need for action |
| 2 | Solution approach additive manufacturing |
| 3 | Economical features |
| 4 | Market potentials |
| 5 | Fields of action for implementation |
| 6 | Project planning |
| 7 | Case studies |
| 8 | Tools and bibliography |

Content

| | |
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Permant changes...

Customer and market related trends

1. Continuous price pressure and market consolidation
2. Rising customer sensibility regarding shorter lead times, adherence on delivery dates, change flexibility and due date promise of orders
3. Demand of individual products
4. Compression of product life cycles and rising demand volatility


Development and production related trends

5. Reduction of time-to-market
6. High innovation demand
7. Rising technological complexity
8. Rising variety of models and features

Production and procurement related trends

9. Mass Customization/ customer individual production
10. Focus on core competencies
11. Development of suppliers for systems and modules
12. Globalization of production and procurement



 ... constantly challenge enterprises.

Global demands...

Challenges

Barriers



Complex geometries and functional integration
Components have complex properties
→ Close linkage of new materials and mechanical and electric properties.

Integrated systems demand innovative production technologies instead of conventional technologies.



Small series & differentiated parts
Today's production has to answer to short-time production planning with a high degree of individualization.

The fulfilment of these new production demands restrict methods of mass production resulting in efficiency deficits.

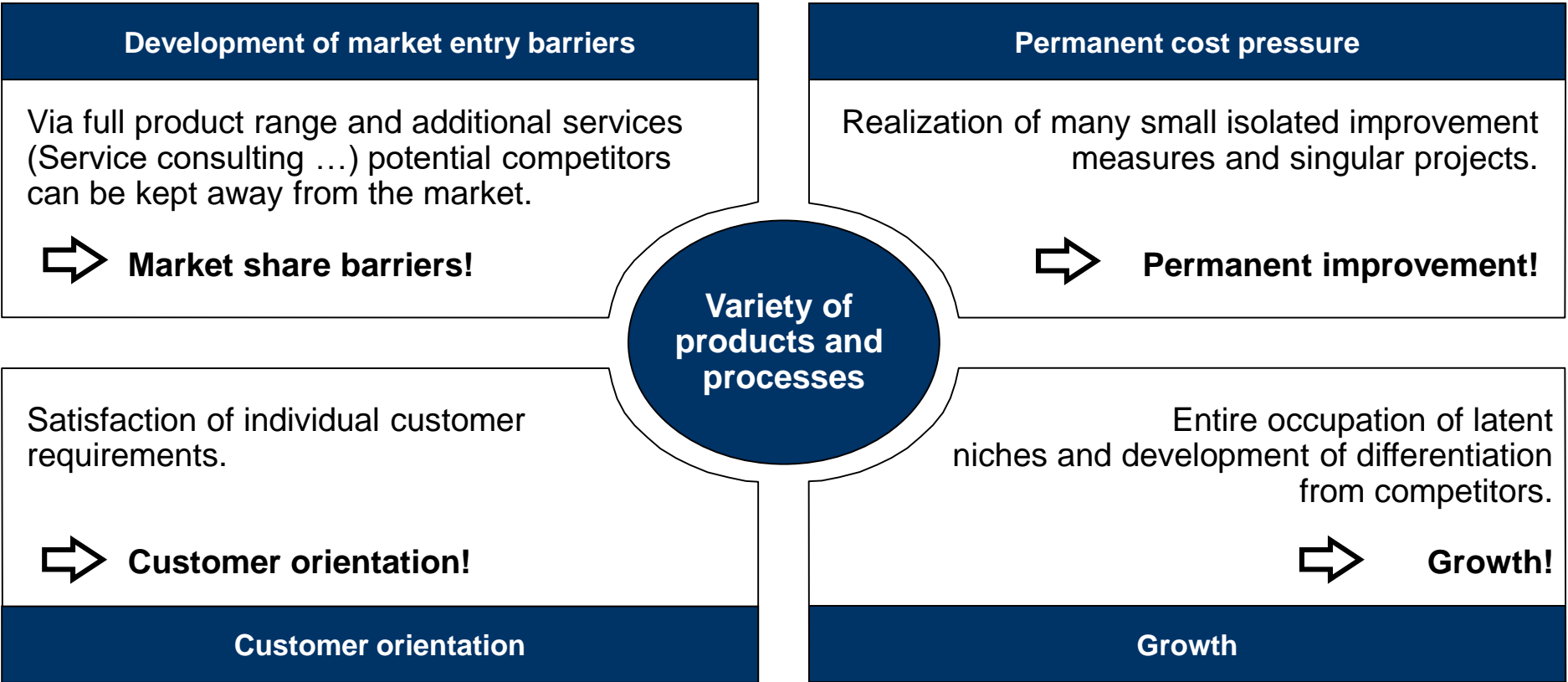



Lean Production
Cost effective weight and performance optimization. Improvement in fuel consumption and performance can be achieved through weight optimized construction with weighted stress distribution.

Maximum performance with minimal material usage is restricted by the characteristics of construction tools and production processes.

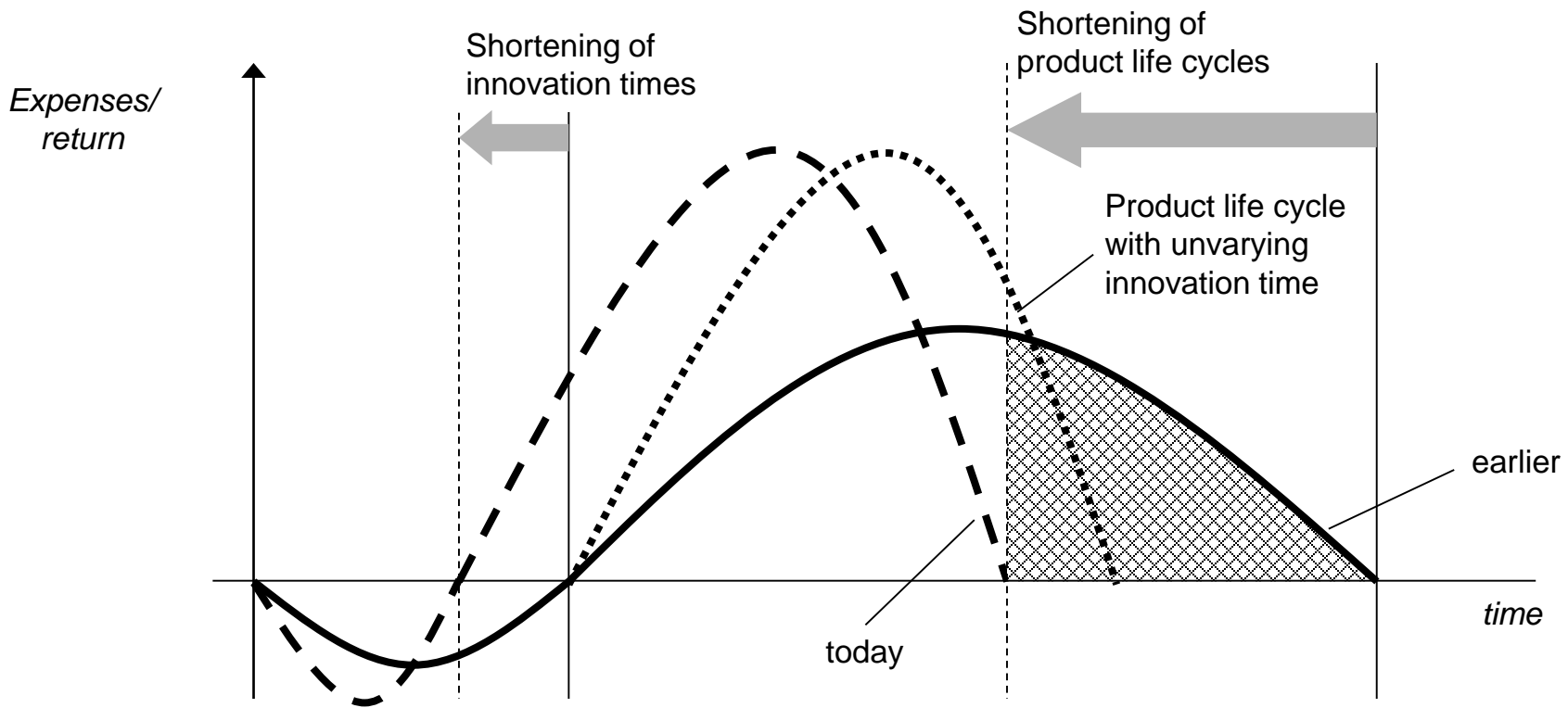
 ... force enterprises to implement new, innovative production technologies.

Causes of rising complexity...



 ... originate in a rich variety of products and processes induced by markets and enterprises.

The shortening of product life cycles ...



 ... demands proportionate decreases of the innovation times.