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FRAUNHOFER INSTITUTE FOR INDUSTRIAL ENGINEERING

MANAGEMENT SUMMARY

MANUFACTURING WORK OF THE FUTURE – INDUSTRY 4.0

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The course of the past few years with the greatest economic crisis since World War II and the subsequent rapid economic recovery has shown that manufacturing is a guarantee for the stable competitiveness of the German economy. But what answers does manufacturing work provide for the future challenges of business? Volatile markets, new global players, fast-paced markets, customized products and complex manufacturing processes require from companies to be more flexible and responsive than today. At the same time, it is important to maintain the high level of productivity and quality of today.

New research approaches lead to the latest technical developments such as industry 4.0, flexible low-cost automation and the use of mobile devices and social media - also and especially in the field of manufacturing. Based on this development, the question arises: "How will the manufacturing work of the future look like?"

The recent Fraunhofer IAO study "Manufacturing Work of the Future – Industry 4.0" is researching the questions:

- What kinds of trends and developments in future manufacturing work can be expected?
- What new solutions for successful manufacturing work derive from the use of new technologies, such as of mobile devices, cyber physical systems (CPS) and social media?
- How will the mega-trend "flexibility" impact the manufacturing work of the future?

This study is aimed towards readers of manufacturing and technology-oriented industries. In particular: executives, professionals and consultants. Furthermore, this research study is suited for all people who are interested in the future picture of the manufacturing work in Germany and those who want to help to shape it.

Objective

The objective of this study is to identify critical success factors for an innovative and competitive design of the future manufacturing work.

Approach

The study was based on a two-part survey. 661 manufacturing companies initially took part in a combined postal and online survey. Three out of four participants were managing directors, manufacturing or plant managers. In addition to this, interviews were conducted with 21 well-known experts from the German manufacturing, research and union sector – including representatives from innovative manufacturing and high-tech companies, leading researchers working in the topics of manufacturing work as well as other association and union representatives.

Results

The main results of the study can be summarized in eight statements, pointing out the expectations for manufacturing work of the future:

- Automation will be possible for even smaller batch sizes - but human labor remains an important part of manufacturing.
- Flexibility will remain the key factor for manufacturing work in Germany – in the future even more short-termed than today.
- Flexibility needs to be applied in a systematic way and must be organized systematically - "general flexibility" will no longer be enough.
- Industry 4.0 is more than interconnected cyber physical systems. The future includes intelligent data acquisition, storage and distribution through objects and people.
- Decentralized control mechanisms will penetrate manufacturing. However, in the foreseeable future, full autonomy of decentralized, self-controlled objects will not become reality.
- Safety aspects (safety and security) must already be taken into account in the design-stage of an intelligent manufacturing site.
- Traditional tasks of manufacturing and knowledge workers will continue to grow together. Manufacturing workers assume increasing responsibilities for product development.
- Employees must be qualified on-the-job for short-term and less predictable work activities.

Conclusion

The study results reflect the present expectations in theory and practice. They serve as an impetus and a basis for discussion in order to make the manufacturing work in Germany sustainably competitive. With this study, the Fraunhofer IAO is helping to answer the question of: "How can the expected changes of manufacturing work successfully be designed and implemented in existing work environments and companies?"

Join Now – Participation Possible

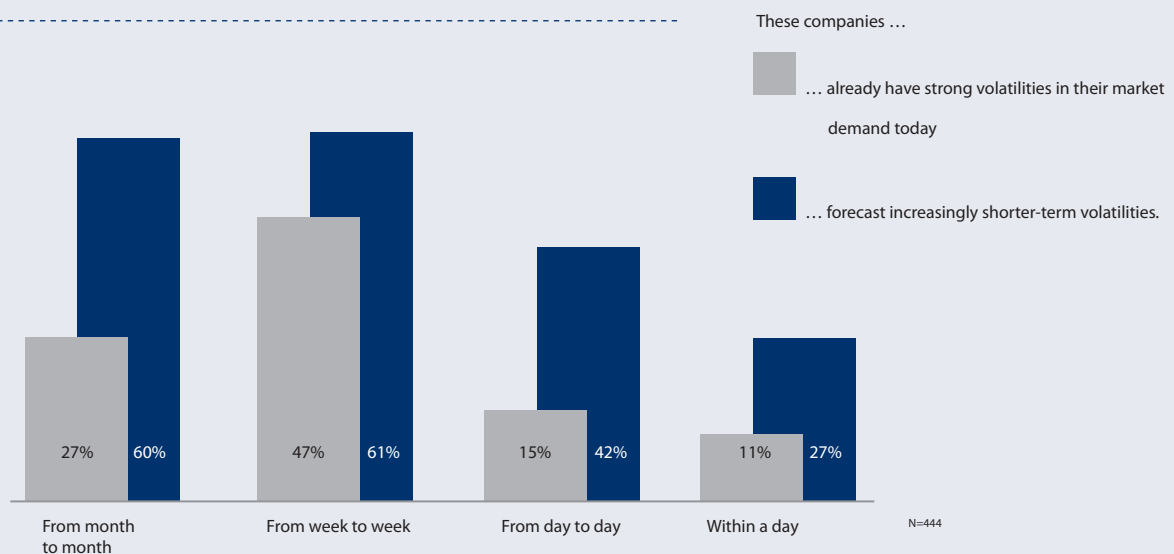
The Fraunhofer IAO will start the Innovation Network "Manufacturing Work of the Future - Industry 4.0" in September 2013. Manufacturing companies and research partners will work together to find new answers and solutions for the future of manufacturing work in Germany. The Network will set up the „Future Laboratory for Industry 4.0" to create a testing area for Industry 4.0. The goal is to explore use cases and to apply new technologies such as mobile information and communication technologies for example for integrating social media in manufacturing. Be part of the design team for future manufacturing work!

Further Information

For more information about the authoring department of the Fraunhofer IAO – Competence Center Production Management – and our services, see www.produktionsarbeit.de

To discuss the future of manufacturing work in Industry 4.0 see our Fraunhofer IAO Blog at <http://blog.iao.fraunhofer.de>

Flexibility remains a key factor for the manufacturing work in Germany – in the future even more short-termed than today.



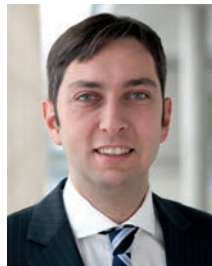
Today strong fluctuations in personnel-related capacity demand are already normal for many companies. In the future, however, the challenge for companies to be flexible increases drastically as volatile markets require shorter termed reactions.

RESEARCH STUDY

MANUFACTURING WORK OF THE FUTURE – INDUSTRY 4.0



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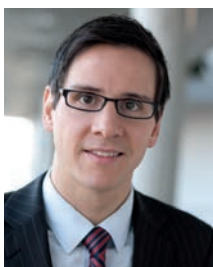
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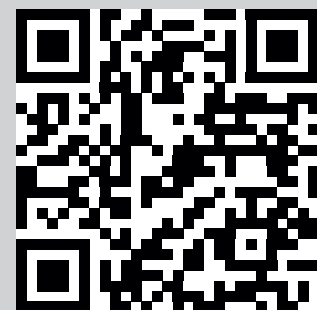
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