



1 *Providing the right information  
on the right time in the right place  
using Mobile IT systems*

## MOBILE IT AS FACTOR OF SUCCESS

The E<sup>3</sup> concept puts the view of interactions among the levels of technologies and equipment, logistics and factory processes, and the integration of the human being into production in a new analytical-methodological context. This change in perspective opens up new opportunities for specific solutions to address key manufacturing engineering requirements by using and implementing synergy effects.

### The challenge

The increase in cross-linking of machines, equipment and logistic processes results in larger data volumes in production companies. The IT systems in use are becoming more and more complex. Company-relevant information, such as shift plans, production programs, and quality data, but also operation status reports, parts lists and process inputs are recorded, collected and processed in different formats and systems. For quicker troubleshooting, for instance during plant maintenance, this information about individual machines and equipment has to be centrally merged at the factory and logistic process level and cross-linked. The ability to make available the right

information at the right moment and in the right position for a specific purpose has a decisive effect on the value of the data. Mobile IT applications could provide the staff with just the right contextual information needed to solve the current task. For this process, assistance systems for production control are required that are capable of extrapolating just the required information from a complex array of data and ensuring an intuitive, user-friendly terminal operation and display tailored to individual hardware. The human being as the creative problem solver moves into the focus of production monitoring, since the cross-linked manufacturing systems' ability to solve problems remains very limited even for the foreseeable future.

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2

## The approach

Standardizing data extraction is a relevant basic precondition for the use of Mobile IT applications in production, because the machines frequently still use different languages for data output.

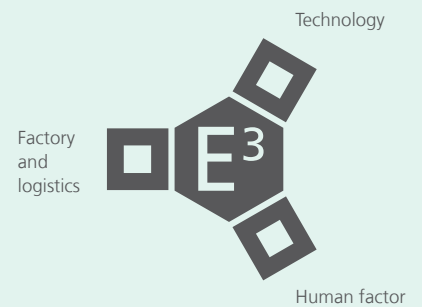
Researchers at the Fraunhofer IWU make use of an adapter that can be extended flexibly. This adapter centrally controls and extends the interfaces that are heterogeneous in terms of their manufacturers. With the help of advanced information processing approaches, such as Linked Data and Semantic Web technologies, the data are stored and cross-linked across systems. Data acquisition and conditioning are performed on the “Linked Factory” platform engineered at the institute. The collected machine data comes together with characteristic values from building control systems, logistics and relevant economic parameters, is linked and then compressed to produce useful information for the user. One essential aspect is the context based provision of that data in the production or factory environment. Thus, for instance, the information required by the head of production is different from that needed by a machine operator or a technician for maintenance. To address such issues, demonstration software for mobile termi-

nals was developed. Terminals at different locations on the shop floor provide the user in real time with information from machine and processes through to the building control system. Personnel can create themselves an information dashboard tailored to their special requirements via Drag&Drop. Another software prototype preprocesses the information according to location, time of inquiry and terminal in use. The software recognizes the users current position and whether he or she is using a tablet, a PC or a smart phone for the information inquiry. Data output is adapted to these variables.

## E<sup>3</sup> effect

The human being is able to optimize value added chains more efficiently, to remove production errors more quickly and to avoid unplanned interruptions in production thanks to the integration of mobile IT systems based on the cross-linking of single machines throughout all manufacturing and logistic levels. .

2 *Fraunhofer IWU develops software prototypes for provision of information depending on the user's situation and context.*



## The E<sup>3</sup> concept

### Mobile IT as factor of success

### Energy and resource efficient production

Integration of information and communication technologies | Efficient production systems | Innovative technologies

### Emissions neutral factory

Process monitoring | Energy and material cycles | Energy management | Quality cycles

### Embedding of the human factor into the production

Knowledge and information | Human factor as creative problem solver | Production assistance | Motivation

## Photo Acknowledgment

Picture 2: iStock, Mimi Potter

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