Fraunhofer

IESE

PROCESS MANAGEMENT

Contact

Dr. Jens Heidrich
jens.heidrich@iese.fraunhofer.de
Phone +49 631 6800-2193
www.iese.fraunhofer.de

Fraunhofer Institute for Experimental Software Engineering IESE

Fraunhofer-Platz 1
67663 Kaiserslautern
Germany

Fraunhofer Institute for Experimental Software Engineering IESE

Software is a part of our lives. Embedded into everyday equipment, into living and working environments or modern means of transportation, countless processors and controllers make our lives simpler, safer, and more pleasant. We help organizations to develop software systems that are dependable in every aspect, and empirically validate the necessary processes, methods, and techniques, emphasizing engineering-style principles such as measurability and transparency.

The Fraunhofer Institute for Experimental Software Engineering IESE in Kaiserslautern has been one of the world's leading research institutes in the area of software and systems engineering for more than 20 years. Its researchers have contributed their expertise in the areas of Processes, Architecture, Security, Safety, Requirements Engineering, and User Experience in more than 1,200 projects.

Under the leadership of Prof. Peter Liggesmeyer, Fraunhofer IESE is working on innovative topics related to digital ecosystems, such as Industrie 4.0, Big Data, and Cyber-Security. As a technology and innovation partner for the digital transformation in the areas of Autonomous & Cyber-Physical Systems and Digital Services, the institute's research focuses on the interaction between embedded systems and information systems in digital ecosystems.

Fraunhofer IESE is one of 72 institutes and research units of the Fraunhofer-Gesellschaft. Together they have a major impact on shaping applied research in Europe and contribute to Germany's competitiveness in international markets.

Division Head

Dr. Jens Heidrich
Phone +49 631 6800-2193
Fax +49 631 6800-9 2193
jens.heidrich@iese.fraunhofer.de

Dr. Jens Heidrich

Software-based systems are becoming ever more important in our professional and private lives. Autonomous driving, Industry 4.0, Internet of Things, or Big Data represent innovations for which software is the enabler. The general trend towards digitalization, however, also leads to various challenges that must be managed with regard to the development of software-based systems. The complexity of the systems, for instance, is increasing continually. On the one hand, technical and business processes – controlled by these systems – are becoming more complex. On the other hand, systems are also increasingly being interconnected with each other in order to provide added value for the customer compared to individual solutions. Product innovation cycles are also getting shorter: In the area of web-based applications, we speak of continuous deployment of new functionality. This trend towards digitalization and system integration also leads to the creation of completely new business models – for instance on the basis of Big Data analyses.

The division "Process Management" of Fraunhofer IESE deals with how a company must position itself in order to address these challenges in terms of processes. This refers to improving the efficiency and effectiveness of development processes of software-based systems as well as to optimizing business and workflow processes on the basis of IT. The process improvement methods are distributed across two competence areas: the department "Data Engineering" deals with data-based methods and the department "Process Engineering" deals with experience-based approaches.

Department Head DE

Dr. Andreas Jedlitschka
Phone +49 631 6800-2260
Fax +49 631 6800-9 2260
andreas.jedlitschka@iese.fraunhofer.de

Dr. Andreas Jedlitschka

Department Data Engineering (DE)

A proven means for dealing with the increasing complexity of integrated systems and mastering them is to set up metrics for development processes and resulting artifacts (such as requirements, architecture, code, or test cases). This makes it possible to detect problems regarding costs, schedule, and quality early on and to initiate appropriate countermeasures. The department "Data Engineering" supports companies in defining integrated, strategic measurement systems. For this purpose, a minimal set of metrics is derived from the corporate goals and IT strategies. Based on the data provided, the improvement potential is identified (e.g., by means of benchmarking); together with the customer, appropriate measures are determined and evaluated in terms of their success.

The increasing digitalization and networking of systems also leads to a rapid increase in the amount of available data. Companies are faced with the question of which benefits they can obtain from this data – and particularly from Big Data – to increase the efficiency and effectiveness of business and workflow processes, to manage risks better, or even to develop new data-based products and services. As an independent partner, the department "Data Engineering" examines the potential of Big Data for companies and establishes an individual strategy regarding which technologies to use and which competencies to develop. In our Big Data lab, data are studied in terms of their quality and benefits with regard to the corporate strategy.

Competencies
- Strategic Measurement Systems
- (Big) Data Analytics

Department Process Engineering (PE)

The capability of delivering innovations to the customer quickly is an important factor for remaining competitive in a hard-fought market. In this context, agile development methods, in particular, have gained much popularity when it comes to rolling out new features as fast as possible while ensuring at the same time that they match the needs of the customer. Using these methods and mastering the underlying practices, however, requires various adjustments, especially in domains with major regulatory requirements (e.g., functional safety or Medical Devices Act). The department "Process Engineering" supports companies in exploiting the potential offered by agile processes. Taking into account the respective constraints, processes are custom-tailored based upon our pool of experiences with agile methods and practices and are evaluated in terms of the intended improvements.

Understanding hardware and software development processes as a unit is the fundamental prerequisite for efficient systems engineering. This trend from software engineering to systems engineering is made stronger by the fact that systems are being integrated across the boundaries of their traditional domains. This is only possible if there is also efficient coordination between the interfaces with suppliers and partners. The department "Process Engineering" examines development processes with regard to these requirements in the context of a 360° analysis. This means that not only are the defined processes themselves aligned with common best practices, but artifacts and technologies from the development process are also assessed individually in terms of their quality. Based on this analysis, an integrated improvement strategy is developed and implemented together with the customer.

Competencies
- Agile and Classical Development Processes
- Process Modeling and Assessment

Department Head PE

Rolf Hendrik van Lengen
Phone +49 631 6800-2103
Fax +49 631 6800-9 2103
rolf.van.lengen@iese.fraunhofer.de

Rolf Hendrik van Lengen