RE-ENGINEERING OF SERVICES AS A TOOL FOR INCREASED SERVITIZATION

Thomas Meiren
Onati, September 15, 2016

T-REX
INNOVATIVE STRATEGIES FOR RENOVATION AND REPAIR IN MANUFACTURING SYSTEMS

Fraunhofer IAO

How to develop a new service

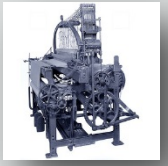
Animation

Industry 4.0

Intelligent technologies are changing manufacturing

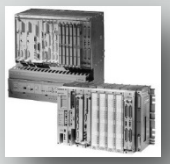
The "4th Industrial Revolution"

1. **Industrial Revolution**
   "Mechanization"



2. Industrial Revolution
"Industrialization"

3. Industrial Revolution
"Automation"



4. Industrial Revolution
"Digitization"

Technologies for Industry 4.0

Data glasses
(e.g. Google Glass)

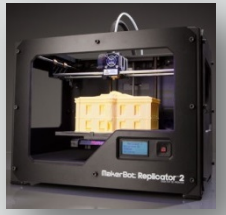
Sensors and actors
Embedded control

Smartphones & Tablets

Cloud Computing

RFID Chips

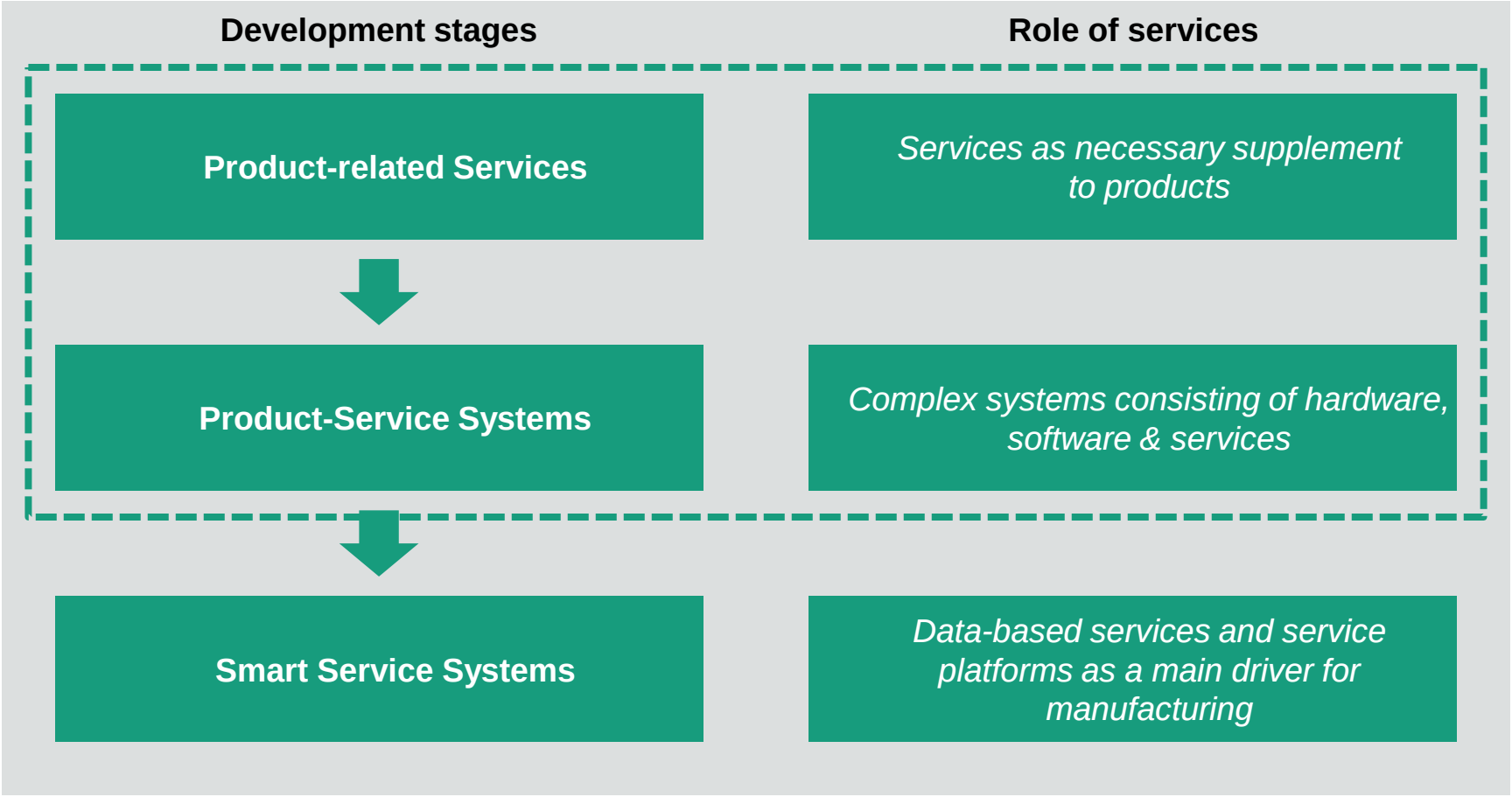
IPv6



3D printing

The evolution of services in manufacturing

New service offerings and service-oriented business models



Smart Services

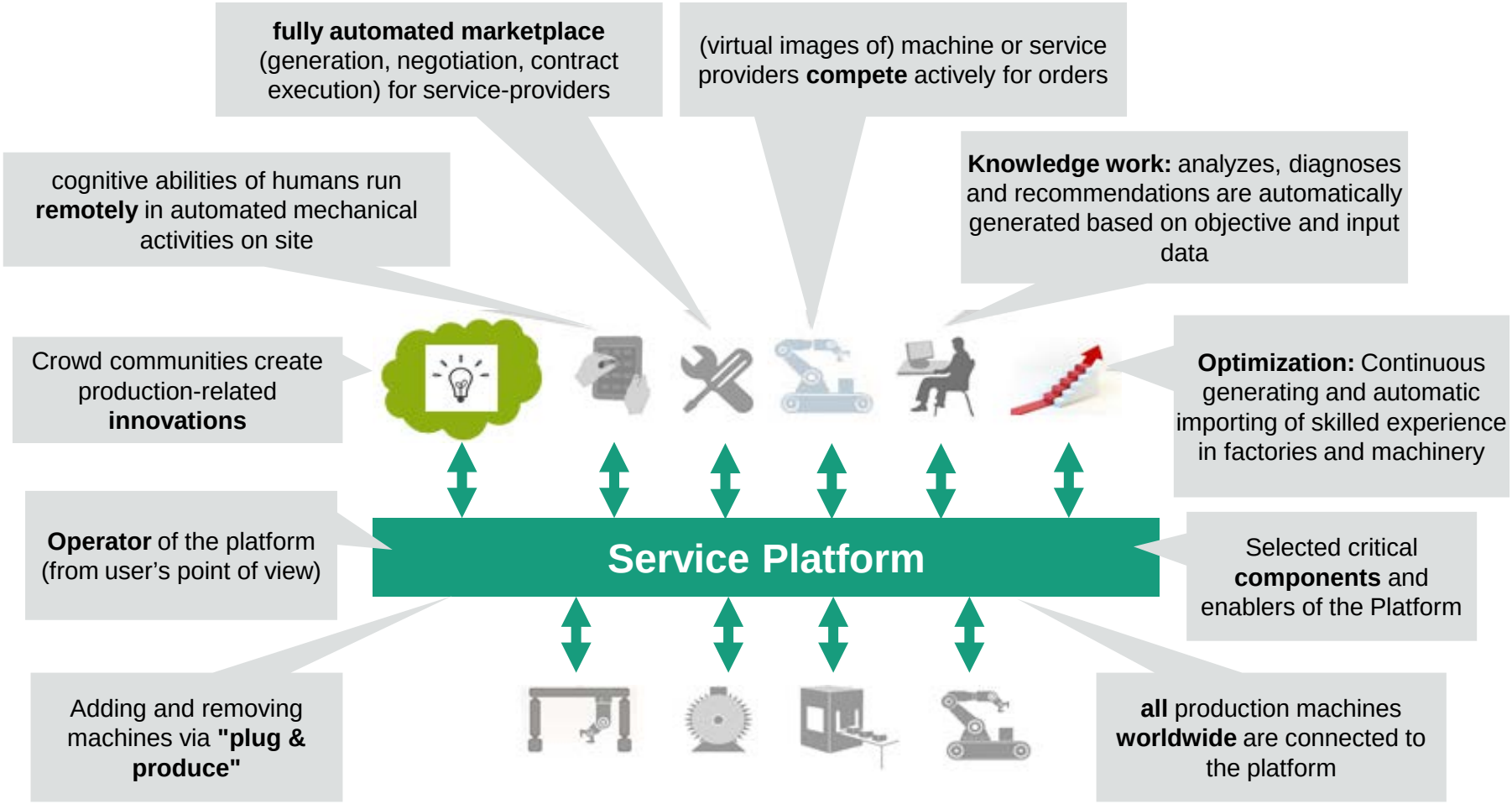
What are Smart Services?

- **Smart Services** describe the combination of physical services (e.g. machine repair) and digital services (e.g. remote monitoring database), which are based on digitally-capable products (e.g. smartphones).

- **Smart Service World** is a strategic initiative of the German government that was recommended by the "Forschungsunion". The working Group consists of 150 representatives from industry, science, trade unions, associations and government institutions.

Smart Services

Smart Service World (Vision 2025)



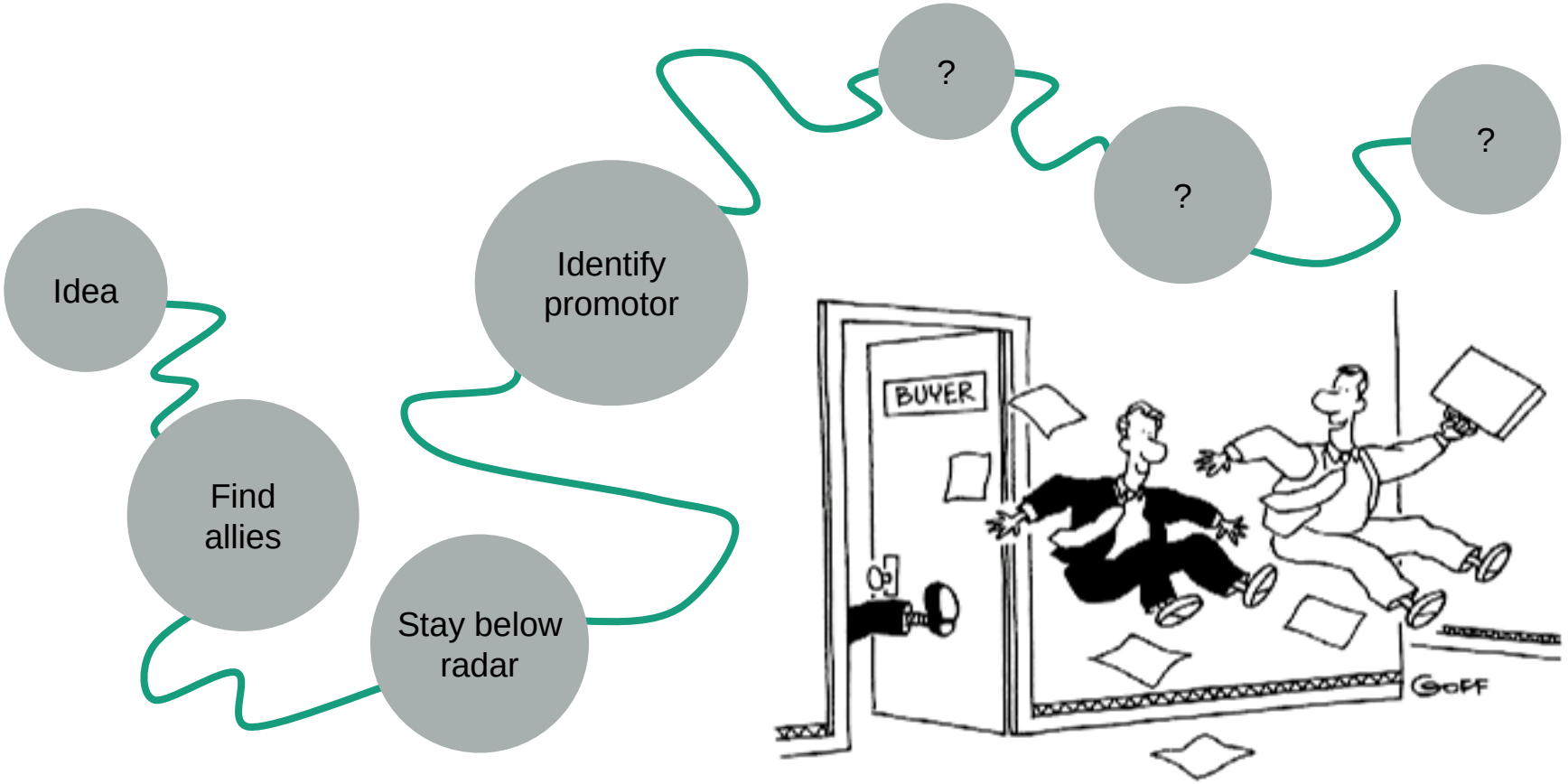
Source: Siemens AG

T-REX
INNOVATIVE STRATEGIES FOR RENOVATION AND REPAIR IN MANUFACTURING SYSTEMS

Fraunhofer IAO

New Service Development in practice

Trial and Error



"I have a good feeling about this. He kicks us a shorter distance every time."

Development of Smart Services

Service Engineering reference framework

Level 1: Development process

Level 2: Development activities

Level 3: Methods and tools

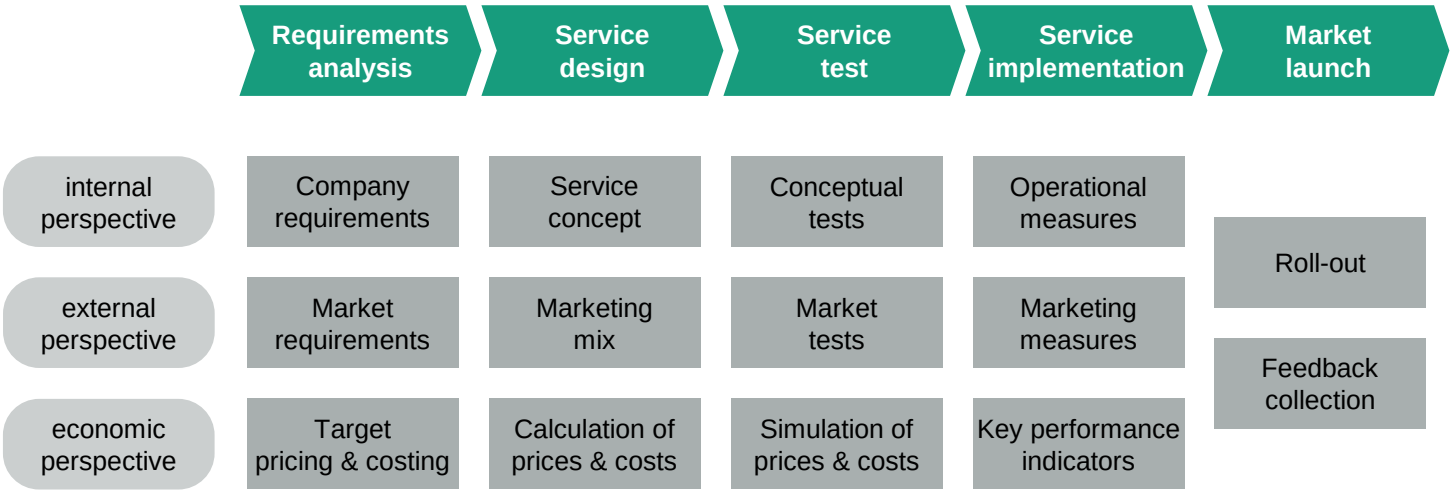
Level 4: Organisational arrangements

T-REX
INNOVATIVE STRATEGIES FOR RENOVATION AND REPAIR IN MANUFACTURING SYSTEMS

The reference framework is a result of the project T-REX (Lifecycle Extension Through Product Redesign And Repair, Renovation, Reuse, Recycle Strategies For Usage & Reusage-Oriented Business Model), funded by the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement no 609005. For more details visit: http://t-rex-fp7.

Service Engineering reference framework

Development process



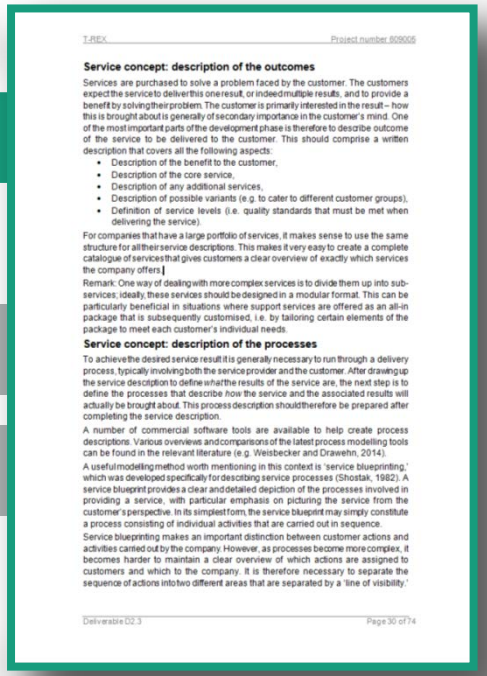
The model describes how to develop a Smart Service step by step.

Due to its modular structure, single activities can be selected for the redesign of existing services.

Service Engineering reference framework

Development activities

	Requirements analysis	Service design	Service test	Service implementation
internal perspective	Company requirements	**Service concept**	Conceptual tests	Operational measures
external perspective	Market requirements	Marketing mix	Market tests	Marketing measures
economic perspective	Target pricing & costing	Calculation of prices & costs	Simulation of prices & costs	Key performance indicators



T-REX Project number 609005

Service concept: description of the outcomes

Services are purchased to solve a problem faced by the customer. The customers expect the service to deliver this one result, or indeed multiple results, and to provide a benefit by solving their problem. The customer is primarily interested in the result – how this is brought about is generally of secondary importance in the customer's mind. One of the most important parts of the development phase is therefore to describe outcome of the service to be delivered to the customer. This should comprise a written description that covers all the following aspects:

- Description of the benefit to the customer,
- Description of the core service,
- Description of any additional services,
- Description of possible variants (e.g. to cater to different customer groups),
- Definition of service levels (i.e. quality standards that must be met when delivering the service).

For companies that have a large portfolio of services, it makes sense to use the same structure for all their service descriptions. This makes it very easy to create a complete catalogue of services that gives customers a clear overview of exactly which services the company offers.

Remark: One way of dealing with more complex services is to divide them up into sub-services; ideally, these services should be designed in a modular format. This can be particularly beneficial in situations where support services are offered as an all-in package that is subsequently customised, i.e. by tailoring certain elements of the package to meet each customer's individual needs.

Service concept: description of the processes

To achieve the desired service result it is generally necessary to run through a delivery process, typically involving both the service provider and the customer. After drawing up the service description to define *what* the results of the service are, the next step is to define the processes that describe *how* the service and the associated results will actually be brought about. This process description should therefore be prepared after completing the service description.

A number of commercial software tools are available to help create process descriptions. Various overviews and comparisons of the latest process modelling tools can be found in the relevant literature (e.g. Weisbecker and Drawehn, 2014).

A useful modelling method worth mentioning in this context is 'service blueprinting,' which was developed specifically for describing service processes (Shostak, 1982). A service blueprint provides a clear and detailed depiction of the processes involved in providing a service, with particular emphasis on picturing the service from the customer's perspective. In its simplest form, the service blueprint may simply constitute a process consisting of individual activities that are carried out in sequence.

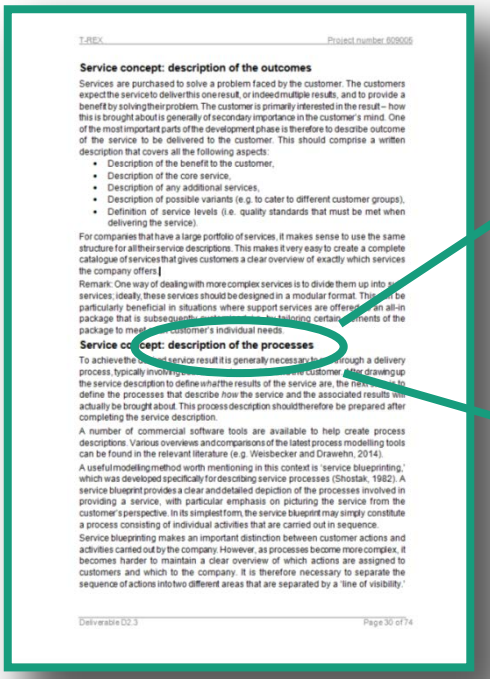
Service blueprinting makes an important distinction between customer actions and activities carried out by the company. However, as processes become more complex, it becomes harder to maintain a clear overview of which actions are assigned to customers and which to the company. It is therefore necessary to separate the sequence of actions into two different areas that are separated by a 'line of visibility.'

Deliverable D2.3 Page 30 of 74

Handbook with detailed descriptions and guidelines for each activity.

Service Engineering reference framework

Methods and tools



T-REX Project number 609005

Service concept: description of the outcomes

Services are purchased to solve a problem faced by the customer. The customers expect the service to deliver this one result, or indeed multiple results, and to provide a benefit by solving their problem. The customer is primarily interested in the result – how this is brought about is generally of secondary importance in the customer's mind. One of the most important parts of the development phase is therefore to describe outcome of the service to be delivered to the customer. This should comprise a written description that covers all the following aspects:

- Description of the benefit to the customer,
- Description of the core service,
- Description of any additional services,
- Description of possible variants (e.g. to cater to different customer groups),
- Definition of service levels (i.e. quality standards that must be met when delivering the service).

For companies that have a large portfolio of services, it makes sense to use the same structure for all their service descriptions. This makes it very easy to create a complete catalogue of services that gives customers a clear overview of exactly which services the company offers.

Remark: One way of dealing with more complex services is to divide them up into [illegible] services; ideally, these services should be designed in a modular format. This can be particularly beneficial in situations where support services are offered as an all-in package that is subsequently [illegible] by tailoring certain elements of the package to meet [illegible] customer's individual needs.

Service concept: description of the processes

To achieve the [illegible] service result it is generally necessary for [illegible] through a delivery process, typically involving [illegible] the customer. After drawing up the service description to define *what* the results of the service are, the next step is to define the processes that describe *how* the service and the associated results will actually be brought about. This process description should therefore be prepared after completing the service description.

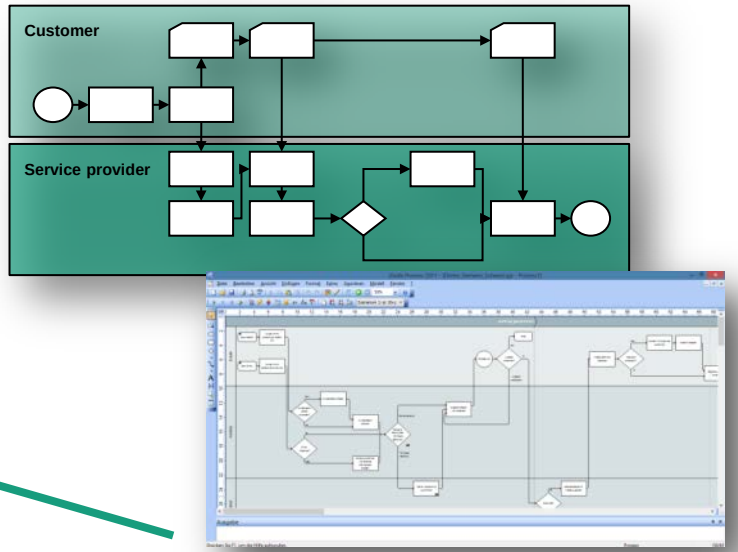
A number of commercial software tools are available to help create process descriptions. Various overviews and comparisons of the latest process modelling tools can be found in the relevant literature (e.g. Weisbecker and Drawehn, 2014).

A useful modelling method worth mentioning in this context is 'service blueprinting,' which was developed specifically for describing service processes (Shostak, 1982). A service blueprint provides a clear and detailed depiction of the processes involved in providing a service, with particular emphasis on picturing the service from the customer's perspective. In its simplest form, the service blueprint may simply constitute a process consisting of individual activities that are carried out in sequence.

Service blueprinting makes an important distinction between customer actions and activities carried out by the company. However, as processes become more complex, it becomes harder to maintain a clear overview of which actions are assigned to customers and which to the company. It is therefore necessary to separate the sequence of actions into two different areas that are separated by a 'line of visibility.'

Deliverable D2.3 Page 30 of 74

Service Blueprinting

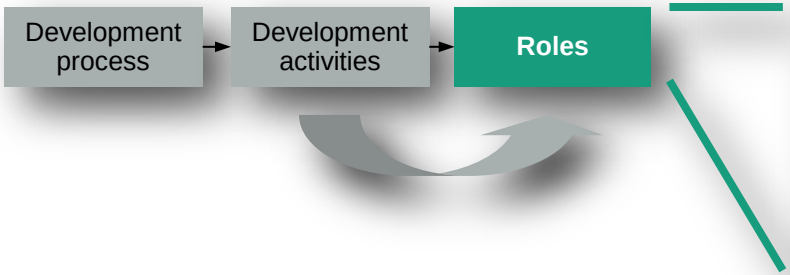


Each activity within the development process is supported by one or more methods.

For practical use, all methods are supported by templates (e.g. MS Office, MS Visio) and/or tools (e.g. modeling tools).

Service Engineering reference framework

Organisational arrangements



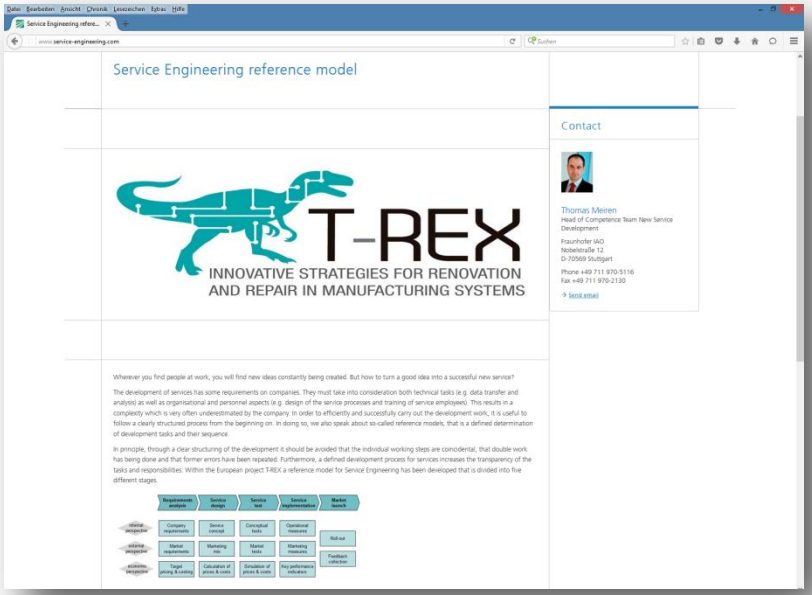
E Execute S Support A Advise	Company requirements	Market requirements	Target pricing & costing	Service concept	Marketing mix	Calculation of prices & costs	Conceptual tests	Market tests	Simulation of prices & costs	Operational measures	Marketing measures	Key performance indicators	Roll-out	Feedback collection
Project manager														
Marketing manager	S	S	S		E	S		S			E	A	S	S
Manager prices and costs			E			E			E			A		
Service product manager	E	E	S	E	S	S	E	E	S	S	S	S	S	E
Operations manager				S			S	S		E		E	E	
HR manager				S			S	S		S		S	S	
Systems manager				S			S	S		S		S	S	
Quality manager							S	S						S

The reference framework is supported by recommendations for its organizational implementation.

E.g., a "role model" describes individual competencies and responsibilities within the development process.

Service Engineering reference framework

Internet-based guideline

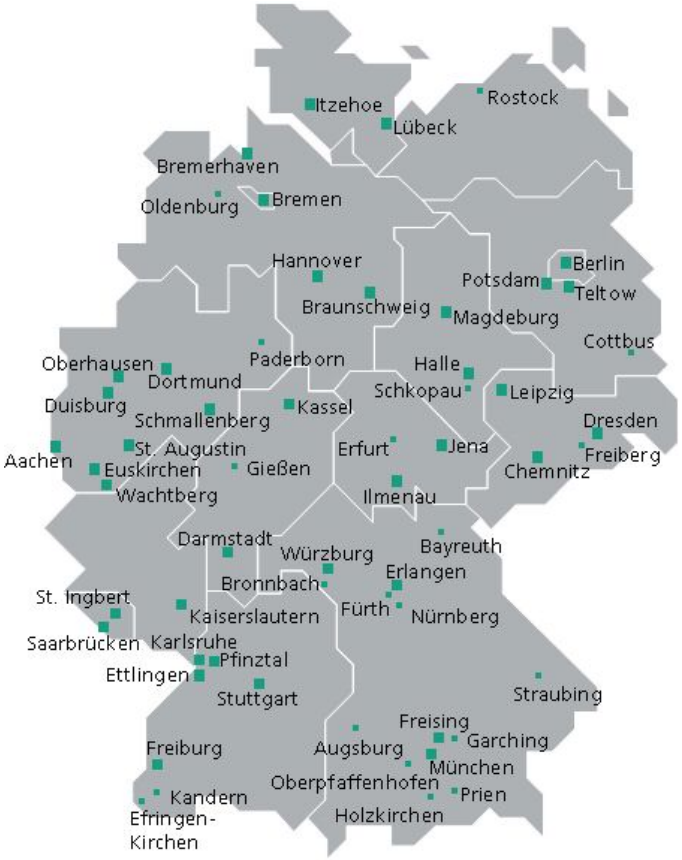


A short version of the Service Engineering reference framework is published on the internet (www.service-engineering.com)

Profile of the Fraunhofer-Gesellschaft

www.fraunhofer.de

The mp3 inventors



- **Non-profit organization for applied research**
- **Founded**: 1949
- 23,000 **employees**
- More than **80 research institutes**, of which 67 operate as independent profit centers
- **Europe**: Brussels (Belgium), Moscow (Russia), Budapest (Hungary), Jönköping (Sweden), Bolzano (Italy)
  USA: Boston (Massachusetts), Pittsburgh (Pennsylvania), Plymouth (Michigan), Providence (Rhode Island), College Park (Maryland)
  Asia: Ampang (Malaysia), Beijing (China), Jakarta (Indonesia), Koramangala Bangalore (India), Seoul (Korea), Singapore, Tokyo (Japan)
  Middle East: Dubai (United Arab Emirates), Cairo (Egypt)

Profile of Fraunhofer IAO

www.iao.fraunhofer.de

- **Founded**: 1981
- **Head of Institute**: Wilhelm Bauer
- **Budget**: 35.7 million Euro, of which 38 % are generated from contract research with industry
- **Staff**: 270 employees

Service Research at Fraunhofer IAO

Selected milestones

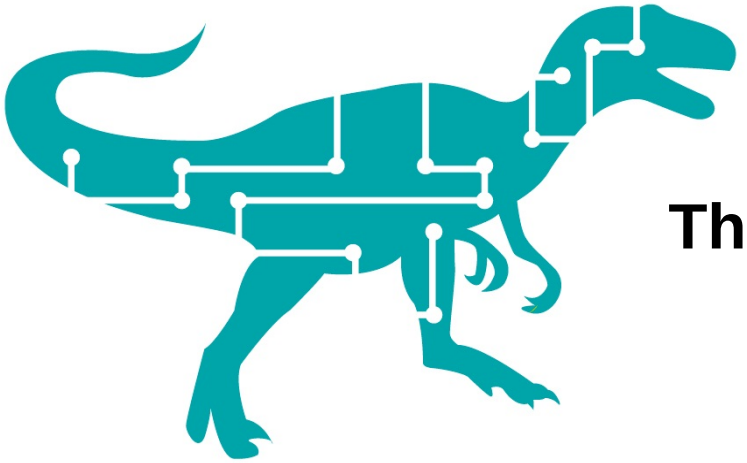
1992-1995:
First research project "Quality Management for Service Providers"

1995/1996:
First research activities in Service Engineering & Design

1995-1998:
Co-ordination of the German initiative "Service 2000plus"

2006:
Opening of the ServLab
First projects and solutions for service testing

Till today:
More than 300 research and consultancy projects on service topics



Thank you for your attention!

Contact for further information

- Thomas Meiren
  Fraunhofer IAO
  Nobelstr. 12, 70569 Stuttgart (Germany)
  Phone +49 711 970-5116
  thomas.meiren@iao.fraunhofer.de

- T-REX project
  http://t-rex-fp7