ENRICH THE WORK OF THE SFB/TR29 IN THE FORM OF COOPERATION IN FUTURE.

IN THE RUN-UP THE TRANSREGIO SUCCEEDED IN GAINING INTERNATIONAL TOP-CLASS SPEAKERS FROM RESEARCH AND INDUSTRY TO PRESENT THEIR VIEW ON INDUSTRIAL PRODUCT-SERVICE SYSTEMS. THEREBY THE TRANSREGIO WAS ESPECIALLY CONCERNED TO INTEGRATE INDUSTRIAL SPEAKERS IN THE SEMINAR TO “GROUND” THE RESEARCH ACTIVITIES. REPRESENTATIVES FROM DAIMLER AG, MAN ROLAND DRUCKMASCHINEN AG, MOORE NANOTECHNOLOGY SYSTEMS AND SYM MEDIA GmbH TURNED OUT TO BE IDEAL PARTNERS CONSIDERING THIS BACKGROUND.

ALL SPEAKERS UNDERLINED THE RELEVANCE OF THE NEW TOPIC, BOTH IN THE BUSINESS-TO-CUSTOMER AND IN THE BUSINESS-TO-BUSINESS SECTOR, FOR FUTURE BY BRINGING THEIR PRODUCTS TO THE MARKET.

FURTHERMORE THE GUEST SPEAKERS PROF. AURICH (KAISERSLAUTERN, GERMANY), PROF. ROY (CRANFIELD, GREAT BRITAIN), PROF. SHIMOMURA (TOKYO, JAPAN) AND PROF. TOMIYAMA (DELT, NETHERLANDS) GAVE A REPRESENTATIVE OVERVIEW OF THE INTERNATIONAL STATE OF RESEARCH. THE GAINED INSIGHT INTO INTERNATIONAL RESEARCH ACTIVITIES AND PRACTICE ORIENTED IMPLEMENTATION OF SERVICE ORIENTATION ROUNDED OFF THE SEMINAR.

THE SEMINAR IS TO BE ESTABLISHED AS AN ANNUAL EVENT WITHIN THE RESEARCH COMMUNITY. HENCE THE NEXT EVENT IS SCHEDULED FOR JANUARY 2009 IN BERLIN. CURRENT INFORMATION ON THIS EVENT WILL BE AVAILABLE IN ADVANCE ON THE SFB/TR29 WEBSITE (WWW.TR29.DE).


FIRST INTERNATIONAL SEMINAR

THE COLLABORATIVE RESEARCH PROJECT SFB/TR29 HELD ITS FIRST INTERNATIONAL SEMINAR ON INDUSTRIAL PRODUCT-SERVICE SYSTEMS FROM 21 - 22 JANUARY 2008 IN BOCHUM. WITH MORE THAN 70 ATTENDANTS FROM EIGHT NATIONS, AMONG THEM GREAT BRITAIN, JAPAN AND CHINA THE TWO DAY EVENT WAS A GREAT SUCCESS.

THE SUBPROJECTS OF THE TRANSREGIO USED THIS PLATFORM TO SHOW UP THE CURRENT STATUS AND THE PRESENT CHALLENGES OF THEIR RESEARCH ACTIVITIES. DURING LIVELY DISCUSSION IN THE PLENUM THE SPEAKERS HAD THE CHANCE TO DISCUSS THEIR APPROACHES AND RESULTS WITH THE ATTENDANTS. THROUGH THIS TALKS INTERFACES TO OTHER RESEARCH GROUPS AROSE WHICH WILL ENRICH THE WORK OF THE SFB/TR29 IN THE FORM OF COOPERATION IN FUTURE.

In the run-up the Transregio succeeded in gaining international top-class speakers from research and industry to present their view on Industrial Product-Service Systems. Thereby the Transregio was especially concerned to integrate industrial speakers in the seminar to “ground” the research activities. Representatives from Daimler AG, MAN Roland Druckmaschinen AG, Moore Nanotechnology Systems and Symmedia GmbH turned out to be ideal partners considering this background.

All speakers underlined the relevance of the new topic, both in the Business-to-Customer and in the Business-to-Business sector, for future bringing their products to the market.

Furthermore the guest speakers Prof. Aurich (Kaiserslautern, Germany), Prof. Roy (Cranfield, Great Britain), Prof. Shimomura (Tokyo, Japan) and Prof. Tomiyama (Delft, Netherlands) gave a representative overview of the international state of research. The gained insight into international research activities and practice oriented implementation of service orientation rounded off the seminar.

The seminar is to be established as an annual event within the research community. Hence the next event is scheduled for January 2009 in Berlin. Current information on this event will be available in advance on the SFB/TR29 homepage (www.tr29.de).

The articles and presentations of the first seminar arranged as conference proceedings are available at booksellers with ISBN 978-3-8322-7227-2 or directly from the Shaker publishing house.
Industrial Product Service Systems (IPS²) could pose one possible solution to the increasing capabilities of competitors from developing markets and the threat of imitation. But an important prerequisite for a successful offer of an IPS² is a sound understanding of the customers’ preferences. In this article we introduce the IPS²-compass of customer preferences to identify a customer’s preference conditional to the values of different preference drivers.

IPS² are characterized by an integrated and mutually determining process of planning, developing, provisionizing, and using of goods and services. They constitute a problem solution for Business-to-Business markets, customized to individual customers’ needs along the IPS² life cycle. The potential of customizing IPS² is primarily based on the possibility of partially substituting product and service components to meet customer requirements. This allows for various possible ways of executing customer processes, service-based or product-based. We label these technological possibilities as different mixtures of manual and automatic execution of processes. Furthermore, there is a second dimension to consider, which describes the customer decision towards make or buy of processes. This two-dimensionality, the variability of technology on the one, and the decision of internal or external production on the other hand, generates additional degrees of freedom for customers and suppliers. Different characteristics of the two dimensions can be seen as different combinations of product-parts and service-parts, but shifting the view from product-parts and service-parts of a problem solution the described two dimensions will allow us to make a more detailed specification of an IPS². These give way to a variety of potential problem solutions which could be offered to customers, with different economic consequences both on the supplier and the customer side.

In this context the question from the suppliers perspective arises of how to identify the respective customer preferences for the various IPS²-solutions. What are the factors that influence customers’ choices regarding the combination of the two dimensions technological possibilities and make-or-buy?

To be able to identify a customer’s IPS² preferences we identified drivers for these preferences and examined their effects regarding the dimensions automatic or manual process execution on the one hand and make-or-buy on the other hand. The identified preference drivers are (i) corporate structure drivers on the one hand and (ii) customer process drivers on the other hand. Corporate structure drivers are customers’ know-how, number of employees, resources, degree of focusing on core competences and orientation towards value based figures. Customer process drivers comprise the complexity and degree of standardization of processes that IPS² are used in, their significance for customers’ value creation and the frequency with which they occur. The effects of those drivers on a customer’s preference and hence his expected choice regarding the two IPS²-dimensions are theoretically examined using the transaction cost theory and the resource based view. The results of this research are shown in the IPS²-compass of customers’ preferences (see figure).

In the IPS²-compass, the effects of an increase of a driver value are shown by the compass needles underneath the drivers. The compass rose in the middle of the figure shows the interpretation of the direction of the needle. For example, the higher the relevant customer’s resources are, the more the customer tend to choose the make-option and an automated execution of the process. Or, the higher the relevant core competencies of a customer, the more the customer will tend to choose the make-option, whereas this driver does not affect the choice between manual or automatic process execution.

The IPS²-compass has to be considered as a starting point for further research. The next step is an analysis of possible interaction effects between the drivers and an empirical examination of the drivers and their effects on customers’ preferences.

Contact
Prof. Dr. Mario Rese
Phone: +49 (0) 234 / 32-26596
E-mail: mario.rese@ruhr-uni-bochum.de

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<th>Drivers</th>
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<td>Expected Choice</td>
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A2 – Development Processes
Descriptive Study and Concept Generation for a Generic IPS² Development Process

Chair of Industrial Information Technologies
Department of Machine Tools and Factory Management
Technische Universität Berlin

Subproject A2 concentrates on the development process of Industrial Product-Service Systems (IPS²) and works on the generation of a generic IPS² development methodology. The focus is on the provision of methods to support the engineering tasks during the early development phases. IPS² specific methods to support the IPS² idea generation, requirements generation and allocation of functions to product or service shares (“function allocation”) are being researched in detail. This contribution introduces an approach which mainly addresses the generation of IPS² requirements.

According to existing product development approaches the formulation of requirements in general has to be independent from functions, (physical) solution principles or (material) system components. Due to the tendency of manufacturers to provide already existing products embedded with services in future IPS² business models (instead of selling them) some system parts are already known very early. These can be taken to start with a systematic variation of the entire system. The approach shown here can be used in such a case to detect, to structure, validate and formalize relevant requirements.

The requirements generation for Industrial Product-Service Systems is broader than this for “pure” products or services. Next to economical and technical requirements strategic ones have to be captured by the requirements list in line with the IPS² business models. The given approach is designed to start with “parallel” views on specific system shares to support a holistic system investigation, addressing all areas mentioned above. Both types of requirements, the ones directly retrieved from customers as well as those from the IPS² context, have to be worked out in parallel and in synergy.

The method – step 1: To investigate the context the future IPS² is being looked at applying IPS² specific views. Each view concentrates on specific material and immaterial “elements” of the entire system. The contract for example is one very important part of the IPS² to closely couple product and service shares (e.g. mobile phone & net provision) as well as all actors (IPS² they are extended by technological and organizational categories. The listed system aspects are used like checklists to retrieve relevant requirements in a structured way.

Step 3: All detected, relevant requirements are formalized according to the requirement categories and system aspect listings.

This method has been tested for the first time in a workshop with engineering design researchers. It was applied to the example of a "micro-manufacturing system with IPS² business model”. The feedback of the participants was used to redesign the method. Furthermore the method is enhanced by application and test on other IPS² examples. Its transferability to other technical systems seems to be promising and the implementation in a computer supported tool seems to be possible.

The next research step will address the mapping of the complete list of IPS² requirements to appropriate realization options which constitute a mixture of traditional technical solution modules with operational service options.

Contact
Prof. Dr.-Ing. Rainer Stark
Phone: +49 (0) 30 / 314 - 25414
E-mail: rainer.stark@u-berlin.de
First International Spring School on Industrial Product-Service Systems (IPS²)

On 25 – 29 February 2008 the first international Spring School on Industrial Product-Service Systems (IPS²) took place in Bochum. The weeklong event within the CIRP working group Industrial Product-Service Systems created by the collaborative research project TR29 was organized by the participating chairs from the Ruhr-University Bochum, the TU Berlin, the University of Cranfield (UK) and the TU Kaiserslautern.

During the Spring School 19 participating PhD students from the involved chairs in the research field of Industrial Product-Service Systems had the opportunity to expand their knowledge and get to know new perspectives on the topic. Via technical presentations and group work sections, besides imparting broad knowledge especially the international network between the participating chairs could be improved.

The presenting lecturers illustrated the current state of the art in IPS² research as well as various fundamentals and applications. The focus was also on tools and methods from the neighbouring sciences to support the further research in the field of Industrial Product-Service Systems. In addition to IPS²-specific topics the knowledge impart and transfer into IPS² research was completed by lectures from guest speakers in the range of marketing, management and design.

The next Spring School is expected to take place on 23 – 27 February 2009 in Cranfield under the direction of Prof. Rajkumar Roy. Involving international experts the main focus will be on Industrial Product-Service Systems in microtechnology. The coming event will be accessible for all CIRP Research Affiliates as well as the research assistants and PhD students of the working group members.

Some photos and further information on the Spring School and the IPS² working group can also be found on the IPS² working group homepage www.ips2.org.

Professor Rainer Stark Continuos Subproject A2

The Transregio succeeded in gaining Prof. Rainer Stark to head the subprojekt A2 “Development Processes – Descriptive Study and Concept Generation for a Generic IPS² Development Process”.

The project was not possible to be continued by the former subproject head Prof. Luciënne Blessing till the end of the current funding period against the background of the funding guidelines of the Deutsche Forschungsgemeinschaft due to her changeover to the Université du Luxembourg.

The already developed excellent results now can be lead to the planned objectives by continuing the project by Prof. Stark.

Prof. Stark heads the business segment Virtual Product Creation at the Fraunhofer IPK since February 2008. Prof. Stark earned his doctorate in 1994 at the Ruhr-University Bochum. During the last 14 years he worked for the automotive manufacturer Ford, at last as European manager “Virtual Product Creation & Methods”. In this position the specialist for CAD, PDM and digital simulation advised the senior management and headed over 30 European and global development projects.

The Transregio thanks Prof. Blessing for her valuable work during the past years and is glad to have found Prof. Stark as a qualified successor.

Seminar Series of the Transregio

The international networking of the Transregio could be intensified by lectures from the guest speakers Prof. K. F. Ehmann (USA), Prof. J. Straatmann (Brazil), Prof. C. Scheffer (South Africa), Prof. J. E. Rooda (Netherlands), Prof. T. Tomiyama (Netherlands) and Dr. C. Skorup (Sweden).

The guest speakers covered a broad topic spectrum from microproduction over mathematical modelling up to sustainability considerations. Ms. Skorup gave a special insight into industrial research; she impressively illustrated the current approaches for using Augmented Reality for staff’s support.

Contact:
Chair of Production Systems, IB 2/126
Ruhr-University Bochum, 44780 Bochum
Tel.: +49 (234) 32-26310
Fax: +49 (234) 32-14157
Internet: http://www.tr29.de
E-mail: meier@ips.ruhr-uni-bochum.de

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