

# X-CHANGE NEWSLETTER

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## X-CHANGE LIFECYCLE PLATFORM

A holistic approach to integrate flexibility calculation and change management in production systems

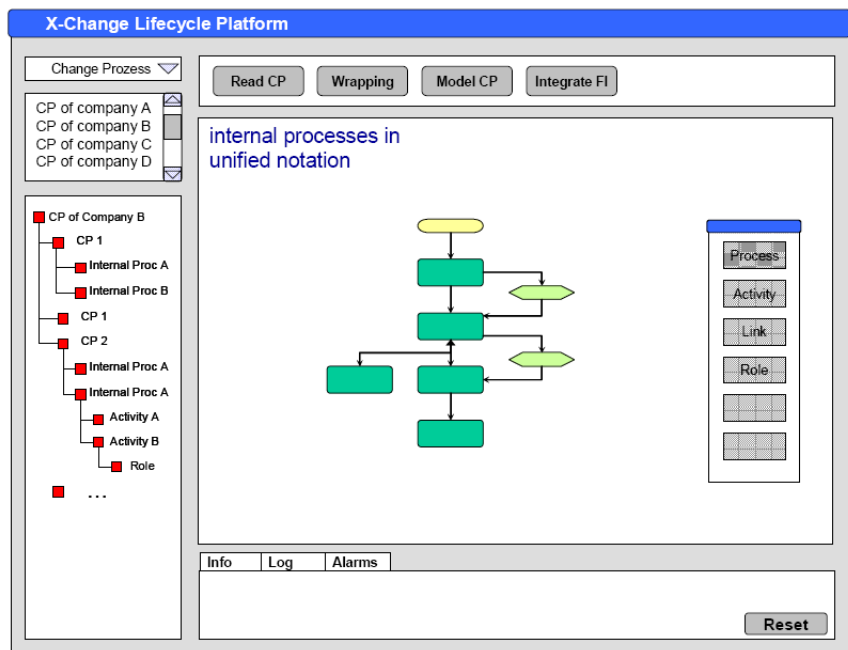
The X-Change Lifecycle Platform is a composition of several components to intelligently support flexibility investigations of a production system within cross-organisational change processes. While in the first stage the requirements of the Lifecycle Platform, with an emphasis on the integration of the Flexibility Measurement into the Change Management, have been specified, the second step identifies the main classes and attributes of the Lifecycle Platform respectively Change Management Platform.

During the current phase the implementation of the Change Management Platform has been completed. Eventually the integration of the Flexibility Evaluation Platform and the Change Management Component concludes now in the overall goal of the project, the X-Change Lifecycle Platform.

Nevertheless the Change Management Platform can be used as a “stand-alone” system that provides the necessary functionalities to set up and

maintain cross-organisational change processes. Therefore an open interface has been developed by which several company internal IT systems, most notably PDM (Product Data Management) and BPM (Business Process Management) Systems can be connected to the Change Management Platform. The necessary com-

pany internal change management information’s can be retrieved from the connected systems and the corresponding change processes can be triggered by the Change Management Platform Furthermore the calculated flexibility measurements can be added to the change process as decision support.



## KEY PERFORMANCE INDICATORS FOR FEP IDENTIFIED

To measure the success of a software tool is a difficult task. The X-Change consortium therefore offers decision support in form of KPIs to address the benefits that can be yielded by the utilization of the FEP by the stakeholders. Thus various key performance and competitiveness indi-

cators have been identified in order to present these benefits in a clear and comprehensive manner. An overview of the indicators utilized is provided briefly hereafter:

1) *Reduction of the time from occurrence of a necessary change to fulfil the change driven requirements.* The

time necessary to implement a newly emerged change is lowered. Reaction time reduction translates into a decrease of the cost necessary to implement a change to fulfil new requirements.

2) *Reduction of adaptation cost.* This means the reduction of the cost of adapting

to a new situation.

3) *Optimization of opportunity cost.* The term “opportunity cost” is used

TABLE OF CONTENTS	
Lifecycle Platform/KPIs	1
KPIs/Validation FEP	2
Project Status/Diss.	3
AITPL /Upcoming Events	4

to describe the capital necessary to take advantage of an opportunity that has arisen. This can be located as faster and adequate reactions to changes in demands. The cost of implementing an opportunity-driven change is reduced.

4) *Reduction of investments for extra tools and machines.* The number of orders placed towards equipment and tool suppliers is reduced and the life cycle duration of existing equipment increases.

5) *Increase in number of re-used production equipment.* The cost of production equipment replacement may be reduced, and the existing machinery will be utilized towards multiple production targets.

6) *Reduction of sales loss due to unexpected economical developments.* This

means that the company can adequately cover demands in regions where unexpected economical developments may take place.

7) *Increase utilization of human resources.* This is expected to lead to an increase in the production rate of manpower-driven departments.

8) *Increase utilization of machine resources.* This means an increase of production rate in automated or semi-automated departments, reduction of idle times and better utilization of the production machinery, tools and equipment.

9) *Reduction of orders which are turned down due to variants in product specification and lot size.* This can be translated into an increase in the volume of outgoing orders, financial income growth and increased cus-

tomers satisfaction.

10) *Increase of sales of products.* An increase in sales can mean an increase in sold products volume, an increase in profits, or growth in the company's market share.

11) *Inventory reduction after application of project's results.* This can be shown as a decrease in the company's annual or monthly inventory costs. Alternatively, inventory reduction can be indicated when studying the outgoing orders towards suppliers.

12) *Reduction of adaptation time.* This means the reduction of the time needed to adapt to a new situation, a faster reaction to changing circumstances.

## VALIDATION OF FLEXIBILITY PLATFORM STARTED

This phase of the project is dedicated to the evaluation of the flexibility evaluation platform generated by the project. Furthermore, the verification and validation exhibited will reassure that the methods and tools developed in the previous phases are in line with the needs of the industry and can be applied in a number of defined case studies.

The execution of the case studies identified in the beginning of the X-Change along with a number of relevant criteria such as efficiency and reliability will be used for the purposes of this phase.

Since one of the main targets of the X-Change project is the development of a flexibility evaluation plat-

form that will cover a wide range of applicability in order to assist responsible production engineers in a number of situations (for example investment decisions, flexibility evaluation a production system under investigation etc), it is important to verify that the developed platform is indeed capable of satisfying these needs.

Thus, the execution of use cases presented aims to test the usability, efficiency and reliability of the flexibility evaluation platform.

It is the nature of evaluating specific use cases that the applicability of some of the measures contained in the developed flexibility evaluation platform can

only be presented. The selection of the measure to apply in each use case is performed accordingly to the specific characteristics of the measure, the specifications of the use case and the needs of the stakeholders.

In conclusion, during the validation stage, the practical applicability of the Flexibility Evaluation Platform in multiple, dissimilar industrial cases has been explored and presented successfully. The accuracy and validity of the flexibility measures was

examined and successfully validated.

Furthermore, it was demonstrated that the FEP can be utilized in a wide range of cases and problems. Within the context of the FEP's exhibition, the exploitation of its results was also discussed and presented. The benefits and advantages offered to the FEP's end-users were proven to be real and substantial, thus validating that the developed platform can act as a valuable tool in the hands of its users.



X-Change Consortium at RQ Meeting in Helsinki

## CURRENT PROJECT STATUS

In the beginning of the project, the X-Change business case studies have been analysed and four dedicated case studies have been identified.

Based on these case studies flexibility modelling as well as change management aspects have been deduced.

Accordingly, the Flexibility Evaluation Platform has been developed as a “stand-alone” module. The offered functionalities include the integration of five flexibility methods as web services.

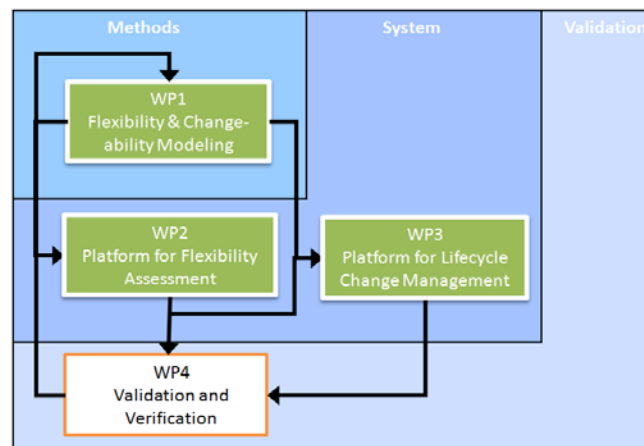
In parallel the architecture for the overall X-Change lifecycle Platform has been developed and the implementation was finalised during this month.

The Validation of the

FEP has been successfully finalized.

The overall IT architecture was realized as a service oriented architecture in which all relevant components are embedded in a loosely coupled manner.

The next step will be to validate the X-Change Lifecycle Platform as well as to put the exploitation activity plan into action.



## DELIVERABLES

### AVAILABLE X-CHANGE DELIVERABLES

#### D5.1 X-Change Web Portal

*The X-Change portal provides the main dissemination tool of the project, but is also the gateway to the X-Change special interest group.*

#### D5.2 X-Change Dissemination Report

*Within the dissemination report all promotional activities of the consortium are listed in detail and referenced to the corresponding events.*

#### D5.4 Cluster Interaction Report

*The cluster “ambient intelligence technologies for the product lifecycle” will be used for research input and dissemination in a wider scale. Within this report the results of the interaction with other parties in this cluster will be accounted.*

## DISSEMINATION

### One Selected Publication

The upcoming AITPL Cluster Book 2008 “New Technologies for the Intelligent Design and Operation of Manufacturing Networks” will cover one article of the X-Change project “Development of Flexibility Methods and their Integration into Change Management Processes for Agile Manufacturing” which came to life as a collaboration of all participating research partners. The abstract describes the problem and the challenges:

In the last decade, production companies are confronted with an ever more complex and fast-changing environment, which is the

result of an increasing individualization of the customers. Shorter product lifecycles and increased number of new models and variants have forced companies to improve the flexibility of their production systems, so they can easily adapt to changes. Flexibility is a major competitive advantage in response to continuously changing market environments. Companies have to integrate a rising number of products and product varieties whereas the predictability for determining manufacturing break evens, turnovers or sales is decreasing. As a result, the success of a company depends more and more on the ability to recog-

nize internal and external influences as early as possible and to react to resulting changes with an adaptation of their organizational structures, and eventually their production systems.

With this background, flexibility has been seen for many years as an important performance factor, which represents a significant feature of companies in order to master the complex situations on the market. It enhances the probability of surviving and at the same time ensures a long-run success of the company. In this context, the introduction of novel methods and tools which support the planning

and monitoring of a production system constitute a substantial assistance for manufacturing enterprises in order to enable them to come to a rational decision about necessary changes. Such kind of support will allow to reduce reaction time from occurrence of a change necessity to fulfilment of the requirements, reduce the number of inquiries, which have to be refused because they cannot be fulfilled during adaptation phases, reduce the necessity for extra tools and machines, reduce adaptation cost, and increase the portion of re-used production equipment.



Flexible Change Management for the Factory of the Future



## AITPL CLUSTER ACTIVITIES



The Ambient Intelligence Technologies for the Product Lifecycle Cluster aspires to enable organisations in a networked world to deliver better products in a more efficient way faster to the market by enhancing the product and the product lifecycle processes using ambient intelligence technologies. The strength of the European economy is substantially based on relationships among many enterprises, which together form agile networks, able to react to market demands in shortest time. These networks (sometimes formalized as virtual enterprise for a

specific product) are still competing successfully on a worldwide scale with enterprises from distant countries which offer wages in completely different dimensions. This success can be kept, only, if the networks establish and maintain smooth communications which cover the complete life cycle of the product. Significant effort has been spent to synchronize the product development in such networks.

Impressions of the AITPL cluster meeting in Krakow, Poland, can be seen on top. The next meeting will take place in Berlin,

Germany November 5th. Topics will include

- The clusters' mission regarding common technical fields of shared interest e.g. business process modelling aspects, flexibility of supply chains including SME as well as flexibility of production lines
- The Cluster book and report activities
- The CeBit 2008 preparation
- Pre-normative activities

More information are available at the [veforum.org](http://veforum.org) website.

## PROSTEP iViP SYMPOSIUM 2008

Under the motto "Vitality of Standards - Service Orientation for dynamic enterprises" the next ProSTEP iViP symposium 2008 is going to be prepared. Thus the planning for one of the most important annual PLM conferences is already in full swing. The ProSTEP iViP Sympo-

sium offers an acknowledged and well-established communication platform for users and system vendors.

On April 09 and 10, 2008 the next Symposium will be held at the Ludwig Erhard Haus in Berlin.

## THE X-CHANGE CONSORTIUM



## UPCOMING EVENTS

**ProSTEP/iViP Symposium 2008**, Berlin, Germany, 9.-10. April 2008

**TMCE** (Tools and Methods of Competitive Engineering), Kusadasi, Turkey, 21.-25. April 2008

**41st CIRP** International Seminar on Manufacturing Systems, Tokyo, Japan, 26-28 May 2008

**14th ICE** (International conference on Concurrent Enterprising) Lisboa, Portugal, 23.-25. June 2008

**INDIN** (Conference on Industrial Informatics) Daejeon, Korea, 13.-16. July 2008

**IEEE IIT 2008** (Innovations in Information Technologies), Dubai, 18-20. November 2008

## CONSORTIUM WEBSITES

[www.x-change-project.net](http://www.x-change-project.net)  
[www.imi.uni-karlsruhe.de](http://www.imi.uni-karlsruhe.de)  
[www.frigoglass.com](http://www.frigoglass.com)  
[www.vincent-industrie.com](http://www.vincent-industrie.com)  
[www.psi.de](http://www.psi.de)  
[www.fatman.fi](http://www.fatman.fi)  
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[www.fzi.de/pde](http://www.fzi.de/pde)

## IMPRINT

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