

Can a country/region use PLM and PLM standards to increase its competitiveness and at the same time position itself as best partner?

Kari Penttinen
20.9.2011



Digital
Product Process



Tekes

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The answer is:
YES WE CAN
.....but something else is needed too!

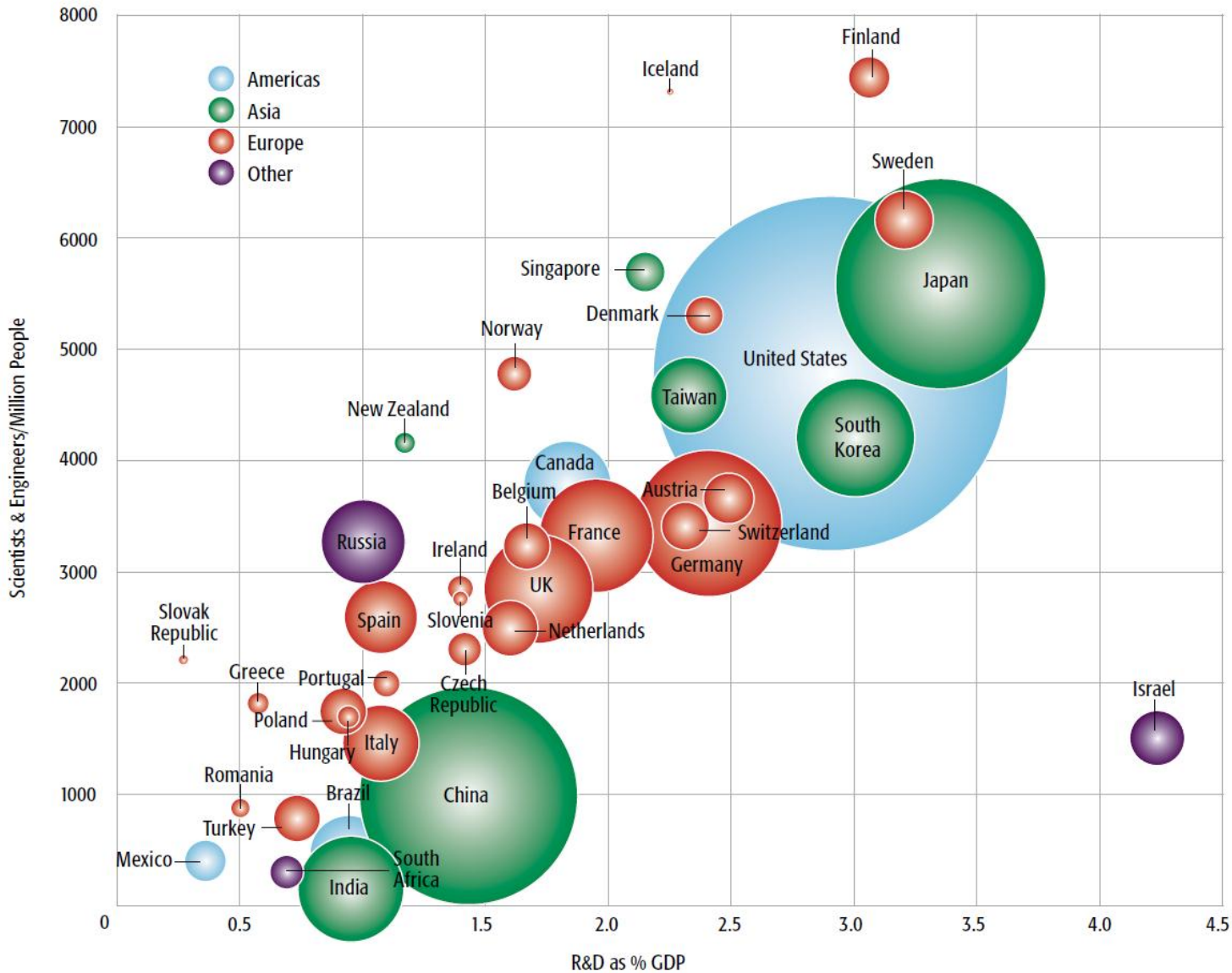


Contents:

1. About Finland
2. About Tekes
3. Programme status and experiences
4. Challenges for future actions

World of R&D 2010

Size of circle reflects the relative amount of annual R&D spending by the country noted.



Source: Battelle, R&D Magazine, OECD, IMF, CIA

The Global Competitiveness Index 2011-2012 rankings

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Country/Economy	GCI 2011-2012		GCI 2010-2011	
	Rank	Score	Rank	Change
Switzerland	1	5.74	1	0
Singapore	2	5.63	3	1
Sweden	3	5.61	2	-1
Finland	4	5.47	7	3
United States	5	5.43	4	-1
Germany	6	5.41	5	-1
Netherlands	7	5.41	8	1
Denmark	8	5.40	9	1
Japan	9	5.40	6	-3
United Kingdom	10	5.39	12	2
Hong Kong SAR	11	5.36	11	0
Canada	12	5.33	10	-2
Taiwan, China	13	5.26	13	0
Qatar	14	5.24	17	3
Belgium	15	5.20	19	4
Norway	16	5.18	14	-2
Saudi Arabia	17	5.17	21	4
France	18	5.14	15	-3
Austria	19	5.14	18	-1
Australia	20	5.11	16	-4
Malaysia	21	5.08	26	5
Israel	22	5.07	24	2
Luxembourg	23	5.03	20	-3
Korea, Rep.	24	5.02	22	-2
New Zealand	25	4.93	23	-2
China	26	4.90	27	1



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**Competitiveness of Finland's IT &
Telecom Industries Today and Tomorrow**

FOREWORD

Jukka Viitasaari

AUTHORS

Teemu Arina
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June 3, 2011

By CHRISTOPHER LAWTON

HELSINKI—Nokia Corp.'s emergence in the early mobile-phone makers lifted Finland from Cold War technology hub and helping to triple its economy b

August 4, 2011

Ones to watch Mobile Entertainment Politics **Entrepreneurs**

AUGUST 4, 2011, 12:22 PM GMT

Nokia's Losses Become Finland's Gains

By Nick Clayton

A few weeks ago [Microsoft's European chairman told TechEurope](#) that the average amount of venture capital per head across Europe was just \$7. Finland beat that with a single deal. The reported \$42 million investment in Angry Birds developer Rovio

About Tech Europe

A blog covering Europe's technology leaders, their companies, the people and industries which support them, and their ideas. Tech Europe is edited by Ben Rooney, with contributions from staff across The Wall Street Journal, Dow Jones and others.

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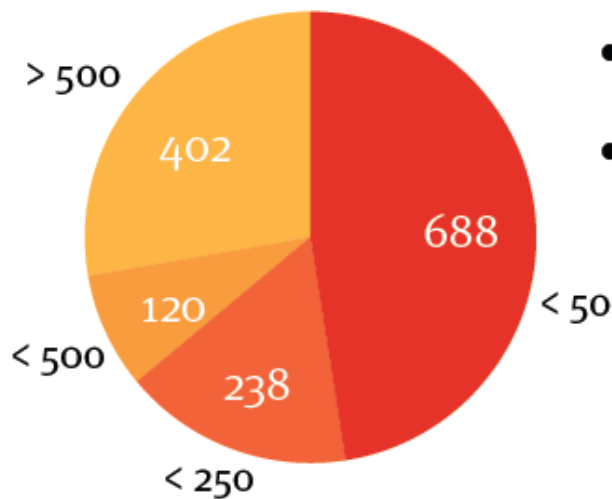
NOKIA
Connecting People



ASPOCOMP

PERLOS

The significance of small companies for the growth of Finnish economy is remarkable:



thousand of employees

- Almost half of Finnish employees work for small companies, and one third of the turnover is generated in these companies.
- There are 320,000 companies in Finland. Over 99% of these companies are small. The share of small companies of the whole national economy has grown in the last few years.

	Companies	Employees	Turnover
< 50	99.1 %	47.5 %	34.6 %
< 250	0.7 %	16.4 %	16.4 %
< 500	0.1 %	8.3 %	9.9 %
> 500	0.1 %	27.8 %	39.0 %

Employees / company



Business model

Product or service innovation

What you innovate

Challenge:
new way to create value

Challenge:
Ecosystemic innovation



Traditional product development



Challenge:
new way to create value

Changing "what"

Changing "how"

Closed

How you innovate

Open



2. About Tekes: Expertise and networks for innovations

■ Tekes services

- Funding for innovative R&D and business
- Networking Finnish and global companies and researchers
- Tekes is non-profit and takes no equity or ownership on intellectual property.

■ Customers

- Finnish and international companies located in Finland
- Universities, research institutes, hospitals etc.

■ Resources

- Budget: 600 million euros annually
- Personnel: 360 in Finland and abroad
- Public agency under the Ministry of Employment and the Economy

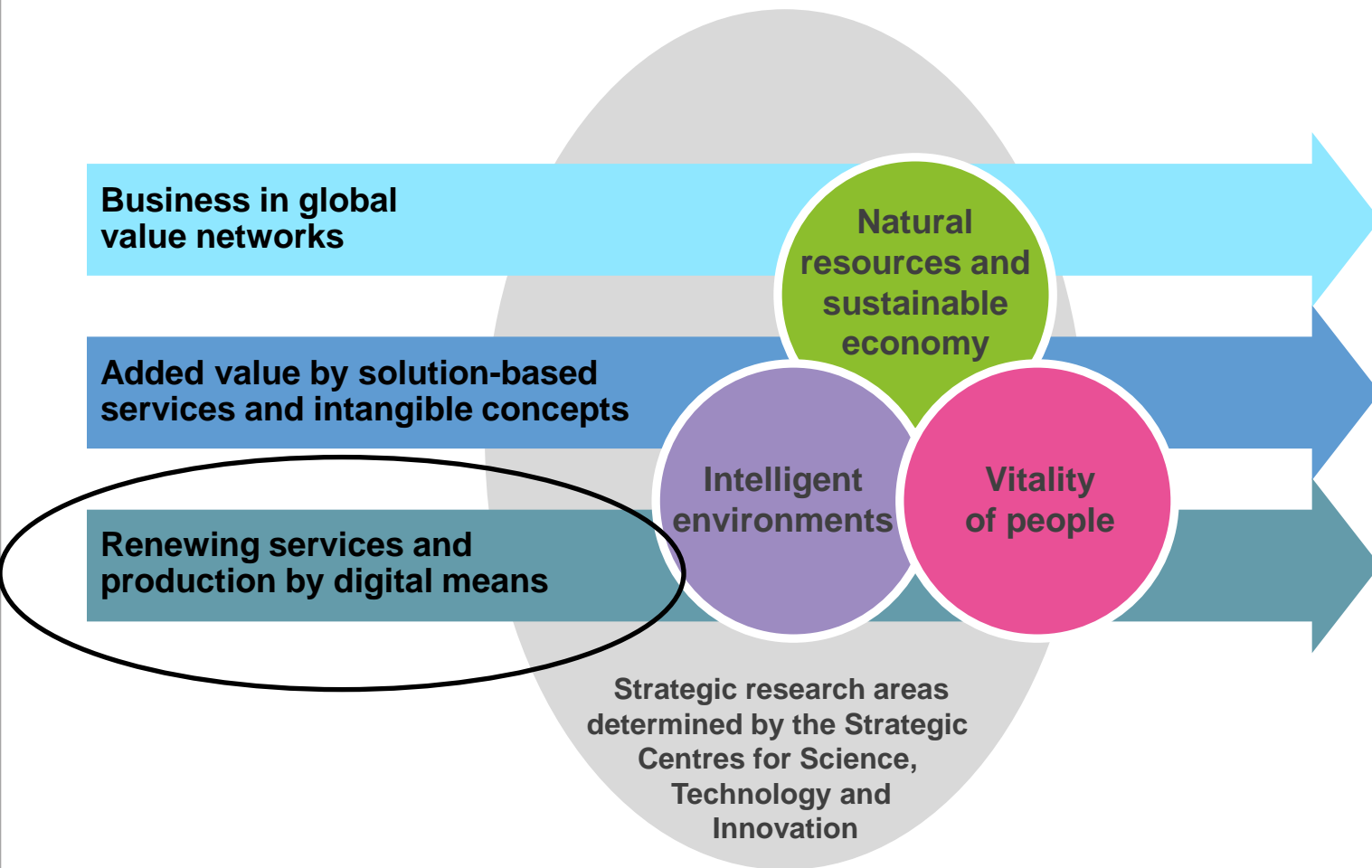
Tekes strategy in a nutshell

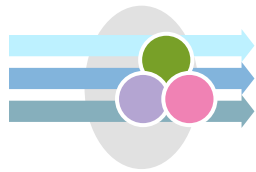
Growth and wellbeing from renewal

- Priority to growth-seeking, innovative SME's
- Increased focus on forerunners and strategic innovations
- Customer success in global value networks
- Services and non-technical contents equally important as industry and technologies
- Tekes will be a more essential part of the innovation services cooperation network
- More customer-oriented and flexible approach



Tekes targets: Strategy Focus areas





Renewing services and production by digital means

Priorities

- New ICT enabled business processes
- Knowledge and information-based business concepts
- Connecting real and virtual worlds





Renewing services and production by digital means

Reasons behind the choice of focus area

- **Comprehensive renewal of organisations by increasing process efficiency, improving overall productivity and increasing the quality of services**
- ICT-based services as a source of a new competitiveness, growth and wellbeing
- User-friendliness and user experience are important competitive factors for services, as is the opportunity for close interaction provided by Internet communities and social media
- Using intelligent ICT applications to bring consumer habits and organisational activities in line with sustainable development
- Utilising our high-quality and extensive data reserves for developing services and innovations



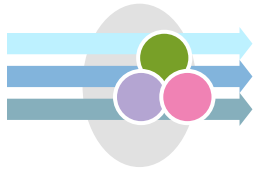


Renewing services and production by digital means

Examples of areas of development 1(2)

- **Digital solutions to support dispersed organisational and operating models**
- Using cloud services to renew organisational information services
- **Using ICT to better manage customer needs and eliminate work that does not produce customer value**
- Green ICT and intelligent systems to promote sustainable development
- Services created on the basis of public sector data reserves
- Utilisation of user communities and customer profiling
- Refining data into information and data reserve services





Renewing services and production by digital means

Examples of areas of development 2(2)

- Cloud services and service centres for managing large amounts of data
- Software products for individual protection and information security
- **Adding value and enriching physical products by means of information found on the Internet**
- Intelligent environment systems and services
- Geographic information systems, products and services based on RFID and NFC (near field communication)
- Business and interaction in virtual worlds
- Use of augmented reality to enrich products and services
- Improving user experience through context-aware services





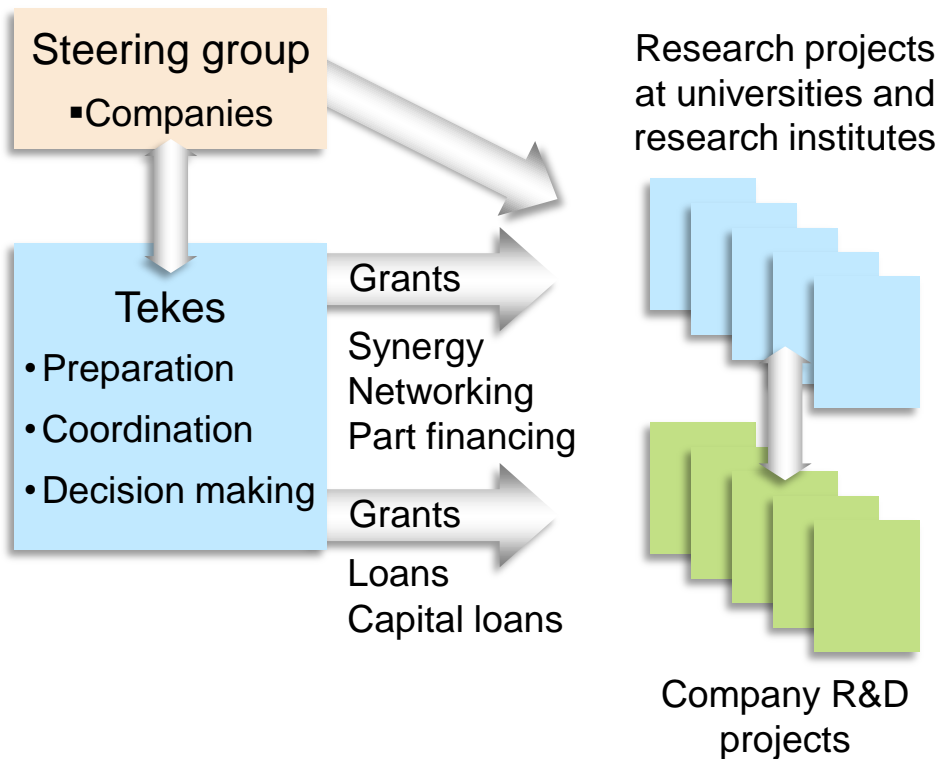
Renewing services and production by digital means

Necessary areas of competence

- Understanding of user experience, new software technologies, cloud computing, embedded ICT and future Internet and network technologies
- **Combination of in-depth expertise in the application area with ICT competence**
- Combining the activities and social interaction of service or product users as well as the operating processes of user organisations in company solutions
- **Software technologies, such as cloud computing, agile methods, offering software as a service, data mining methods, knowledge management and methods of combining information, as well as interface design expertise**



Tekes targets: Tekes programmes in brief



Effective utilisation of research results is ensured by scheduling the projects of research institutes and universities concurrently with company R&D projects, and by networking with them.

Tekes programmes – key indicators 2010

- There were 26 ongoing programmes
- Companies participated in about 3,700 and research units in about 1,500 projects in the programmes
- The combined investment by Tekes, companies and research units in the programmes amounted to 475 million euros
 - Tekes finances programme services and about half the costs of a programme's projects
- Projects of small and medium-size companies accounted for over two third of all company projects in the programmes



Digital Product Process -programme

For better productivity:

Product management from concept to recycling

- Programme duration: 2008–2012
- Programme volume: 100 million euros of which approximately 40 million euros from Tekes
- Further information: www.tekes.fi/dtp



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Digital Product Process programme now:

Research

- 24 projects
- 15 meur total budget of which 10 meur from Tekes
- First 2009 call : 38 Industrial partnes from manufacturing ind. + **12 from IT services**
- Second 2011 call: 30 Industrial partnes from manufacturing ind. + **27 from IT services**

55 industrial projects

- 55 projects , ongoing funding activity
- 43 meur total budget of which 16,5 meur from Tekes
- 40 from manufacturing companies
- 15 from IT or engineering services



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Some project examples close to the themes of this seminar:

Aalto University + ABB, Metso, AAC Global, Inno-W:

Collaboration Environments for Global Distributed Product Processes

Goals: The purpose of this research project is to design, analyze, and evaluate new collaborative working environments (CWE) to develop high quality interactions and collaborations in global product processes, for example, when a company is delivering customer services. CWEs are a combination of infrastructures and environments – including physical, digital, social and organizational structures – supporting individual and collaborative work. We aim to determine factors influencing on their design, implementation, adaptation and use by identifying enablers and hindrances in these environments. Aalto-korkeakoulusäätiö operating as Aalto University (AALTO) coordinates this project.



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Some project examples close to the themes of this seminar:

VTT Technical Research Centre of Finland:

Systems Engineering - PLM integration

Goals: The aim of this project is to find best practices for an integrated product design and product life cycle processes. This is achieved by promoting usage of Systems Engineering methodology in industry as part of their design and life cycle management process, and making use of PLM software's Systems Engineering solutions. Creating a comprehensive overview of current Systems Engineering practices and future trends models are developed that help companies to focus their activities in important development targets.



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Some project examples close to the themes of this seminar:

ABB: Corporate Memory - Management of dynamic and distributed product knowledge in virtual networks

Goals: The goal in the project is to develop new concepts and services for the management of distributed product knowledge in global organizations. The focus area in the better knowledge management 1) competence and knowledge transfer in virtual networks (internal, external), 2) strategic competences and capabilities related to global business development, 3) optimized management of product documentation and its localization. New services and products are developed for better management of distributed product knowledge in virtual competence networks.



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Some project examples close to the themes of this seminar:

THTH Association of Decentralized Information Management for Industry: SEFRAM (Service Framework for Industry)

The objectives of the project are to develop decentralized information management system and a service framework for the industry. The development work is focused on the integration of plant and engineering design systems with service platform interfaces and simultaneous two-directional information exchange between different systems. The decentralized information management system enhances the competitiveness of the companies by enabling an easy integration through a common interface



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Some project examples close to the themes of this seminar:

- **Foster Wheeler Energy:**

FWE NW 2012 – new generation digital product process as a part of networked project business

- **Wärtsilä Finland:** Wärtsilä Virtual Test Engine

Software companies:

- **Modultek:** Product Information Services

- **Eurostep:** Virtual Enterprise PLM Solutions

- **Cieltum:** Product Life-Cycle Configuration Service



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International activities



- Information and expert services for companies
- Use of the services of international experts
- Networking with international partners
- Thematic seminars for companies and researchers
- Seminars on applying the best procedures in companies

- USA, India, Germany, China ?....



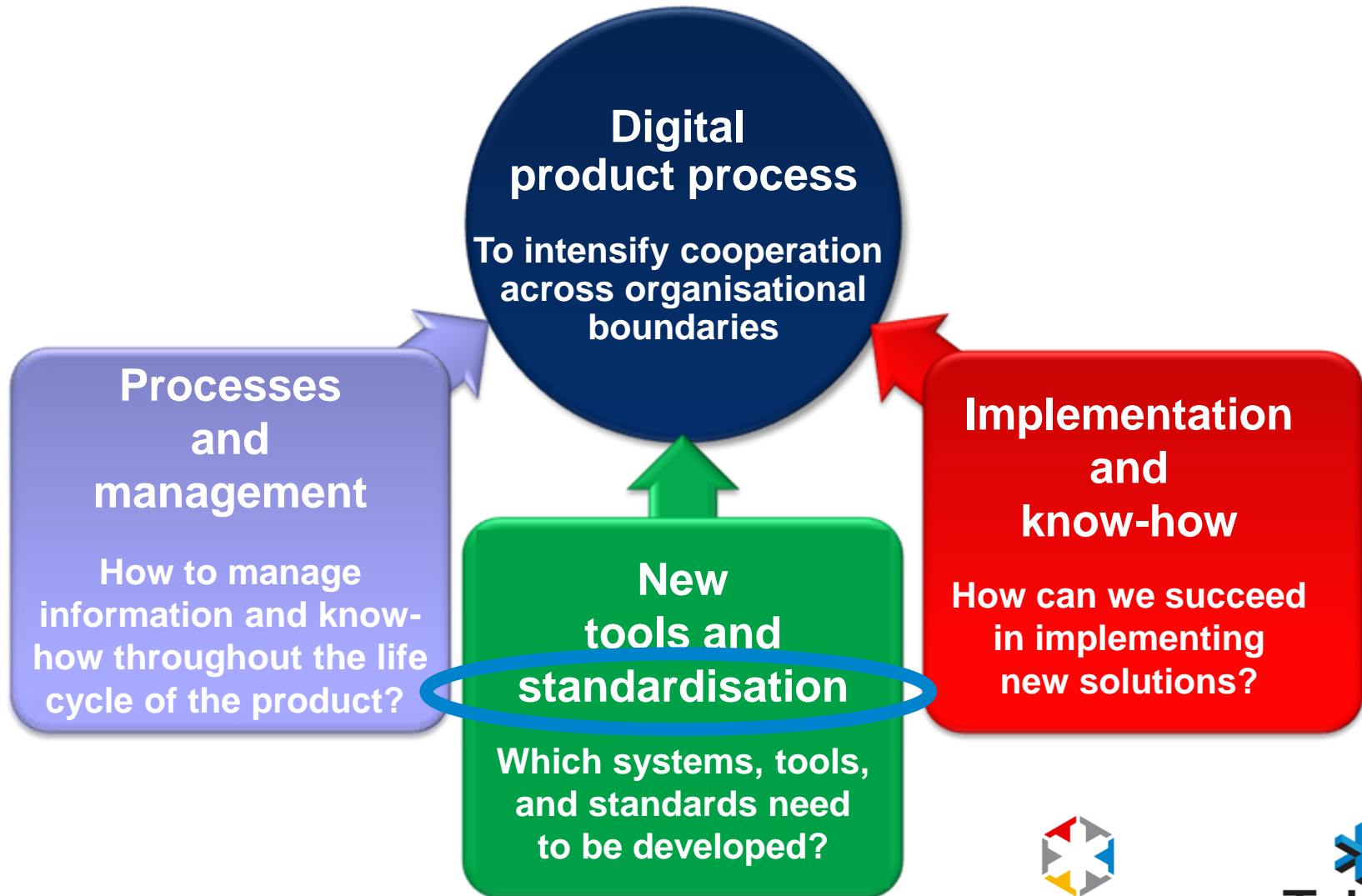
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Main targets of development projects



Challenges for future actions

- Knowledge transfer to SME's
- How to get young people interested?
- Standardization – protectionism?
- The Fifteenth IEEE International EDOC Conference, held in 29th August - 2nd September 2011 in Helsinki - According to this research forum "The standardization initiatives do not have elements to support business IT in service business ecosystems"
- Global knowledge clusters – do they cooperate or compete? (ProStep and eWorks)

Challenges for future actions

ProSTEP iViP shows Profile

<http://www.prostep.org/en/profile.html>

The association was founded in 1993, when leading IT managers at Bosch, Continental, Daimler, Delphi, Opel, Siemens, Volkswagen and 30 other companies realized that the development of modern processes for efficient product data management was crucial to ensuring the ability of German companies to compete in the global marketplace.

e-works

<http://www.eworksglobal.com/about.htm>

e-works is founded by Professor Peigen Li, who is the fellow of Chinese Engineering Academy, and also the president of HUST (Huazhong University of Science and Technology, Top 5 Chinese university.), he is one of the most famous specialists in IT application of manufacturing area in China. Dr. Pei Huang, the CEO and editor-in-chief of e-works, is a famous writer, analyst and critic in IT application of Chinese manufacturing. He has 18 years experience of IT consulting and implement, software development, sales and marketing.

Thank you!

...and ask me or my colleagues in this seminar more about Tekes activities

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