

# Networks and Learning Organisations – Innovation and Team Learning Supports Improvement Programs

Richard MESSNARZ<sup>1</sup>, Gunther Spork<sup>2</sup>, Damjan Ekert<sup>1</sup>

<sup>1</sup>*ISCN GesmbH, Schieszstattgasse 4, A-8010 Graz, Austria*

*Tel: +43 316 811198, Fax: + 43 316 811312, Email: [rmess@iscn.com](mailto:rmess@iscn.com)*

<sup>2</sup>*Magna Powertrain, Lannach, Austria*

*Email: [bruno.woeran@danube.or.at](mailto:bruno.woeran@danube.or.at)*

**Abstract:** The paper will illustrate some example results of an EU project ORGANIC – where learning strategies for organisations have been developed, trialed in companies, and delivered in form of certified training.

The original project was called **ORGANIC** (2005 – 2007) by purpose. Based on different European studies about innovation management where members of the partnership and leading industry have been involved we developed a modern learning organisation based innovation management strategy. A company becomes an ORGANISM where through continuous learning spirals the knowledge grows and the core competences increase continuously. In collaboration with innovation leading companies the project developed an example base which is being exchanged and used in different working task forces since 2006. This is also reflected in the way the innovation manager is transported to industry.

In this paper we want to emphasise that learning strategies and a structured approach to turn organisations into learning organisms are a major influence on the success of improvement programs.

Meanwhile the European Union finances a project called EU Certificates campus (2008 – 2010) where such key areas of knowledge are transported in form of online short courses, together with recognised certificates for innovation management.

## 1. The modelling of a learning strategy

In ORGANIC [9] we run through 20 competence areas when organising a firm into a learning organisation:

- Building Basic Understanding
  - o **Core Competencies and Customer Relationship Management Skills**
  - o Innovation and EU Policies Know-how
  - o Introducing Innovation Management Principles
  - o Knowledge Management Competencies
  - o Market Research Skills
  - o Regional Innovation Strategies Involvement
  - o Human Force Skills Management
- Building Communication Skills

- e-Challenges in Innovation
- Innovation Skills for Reporting&Presentation Skills
- Building Management Skills
  - Corporate Wide Innovation Management
  - Innovation Aspects in Project Management
  - **Innovation Process Management Process**
- Building Team-Learning and Teamworking
  - Cross Cultural Success Factors
  - Innovation Aspects in Conflict Management
  - Innovation Aspects in Motivation Building
  - Innovation Aspects in Team Communication
  - **Innovation Skills for Distributed Team Management**
- Building Personal Skills
  - Cross Cultural Skills
  - Knowledge about Personal Characteristics
  - Learning Culture Establishment

Each of the competence areas has equal importance. For each of the competence areas the material proposes certain best practices and asks the participant to apply that on the own organisation.

After running through all steps you have created the architectural design of a learning organisation tailored to your own needs.

We highlighted three areas in the above listing because we will explain these with examples in the following sections of the paper.

## 2. What is a learning organisation?

A learning organisation [5],[6],[8],[9] creates a positive learning culture and enables team learning and synergy exploitation in an organisation. By team learning knowledge is spread much more quickly and a high level of a skilled human force is maintained.

Typical examples of failure are

- You recognise that for the implementation of a new product or new processes you lack specific skills and have no chance of acquiring them in time.
- You recognise that departments inside the company have the knowledge but do not want to share it with other departments.
- You recognise that your competitors have formed a group to share knowledge and jointly compete against you on the market.
- You recognise that some of your management staff does not fully understand the mission.
- You recognise that someone in your firm bought a knowledge management system but none uses it.
- Etc.

Typical examples of success are

- You linked in time yourself to experience partnerships and training networks and can react on the market immediately with any skills required.
- You manage that knowledge and team learning is used in a synergy approach between the departments and teams.
- You were the one who formed the group that jointly learns and shares knowledge and collaborates against your competitors.
- You ensure that the mission is a goal which binds everyone to a big picture.
- You analyse the core knowledge (the one that differentiates you from the competitors) and build all knowledge management strategies around that core (=realistic and not holistic knowledge management!).

- Etc.

In learning organisations there is an infrastructure in place which enables the team learning and the spreading of knowledge and team communication.

### 3. Samples of Implementation

The full work is published at [www.innovationmanager.org](http://www.innovationmanager.org) and certificates are issued by [www.eu-certificates.org](http://www.eu-certificates.org), with iSQI (International Software Quality Institute) as certification body.

#### 3.1 Core Competence Analysis and CRM Example

One of the key success principles is that organisations understand that they are part of a learning chain. The innovation ideas of customers influence their own innovation tracks. The closer one gets to such key partners the more dynamic the learning cycles will flow.

##### Step 1. Identify Core Competence

A core competence is a field of knowledge of the firm

- Where they are stronger than other competitors.
- Where they created already a critical mass of competence.
- Where with one knowledge item / function many customers can be served (Re-usability).
- Where since years dynamically knowledge is extended, newly created and exploited.

##### Step 2. Identify Key Customers for Learning

Once an organisation identified the core competence fields the next step is to identify which customers are those who most dynamically contribute ideas to this core competence.

A key learning customer is identified as a firm which

- Regularly gives inputs to new functions, ideas, plans for increasing the identified core competence
- Has its own known innovation leadership and can help putting new structures into place
- Is willing to get in closer collaborative partnerships for services and products in the future

##### Step 3. Enable a Social Learning Strategy

Once the key customer and the core competence are identified the organisation creates supportive social learning spaces to further enrich the communication and empower the dynamic feedback flow to the core competence.

In **Figure 1** we illustrate the example of Automotive Systems [7] where core functions of e.g. a control system are the same in all variant projects. The company then decides to develop all base functions just once and maintain parameter sets which allow to apply the same 80% (ready-to-use) functionality by parameter sets to many different customers. The company then learns continuously new functions and decides whether to include them in the base.

This leads in the long run to stable systems working for many customers and focussing the learning on core functions which they can supply better and quicker than any of the competitors.

- Best Practice in IT Systems e.g. Automotive

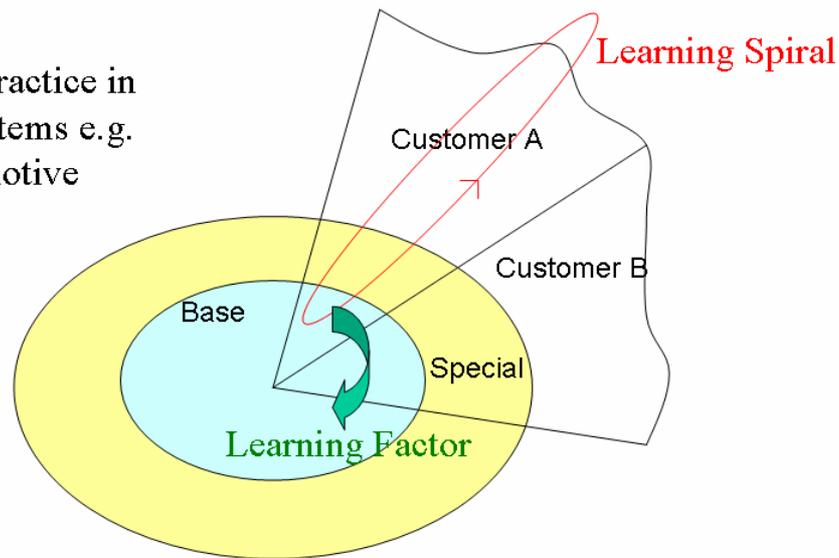


Figure 1: Example – Base Development Strategy in Automotive Systems Development

- Best Practice in educational platforms

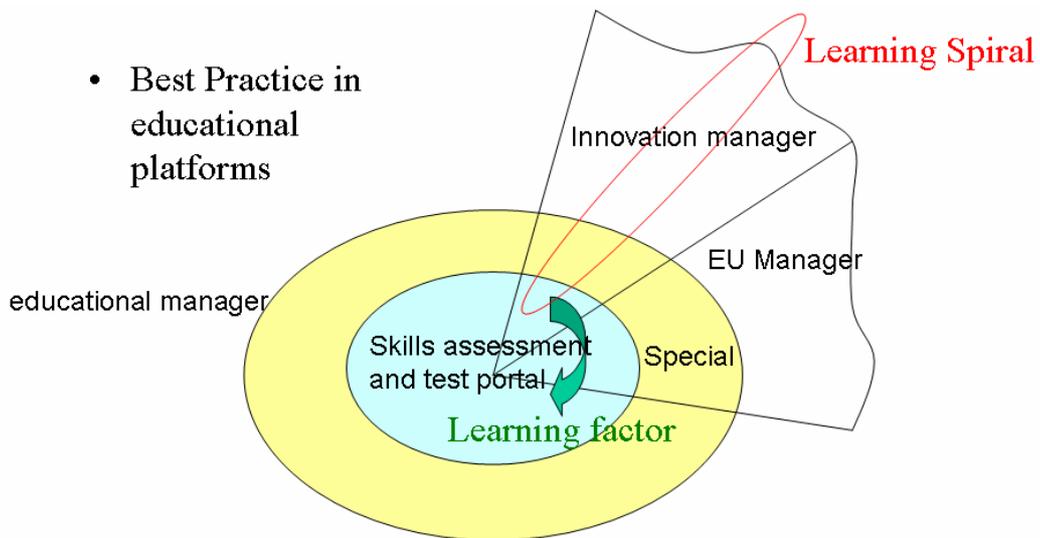
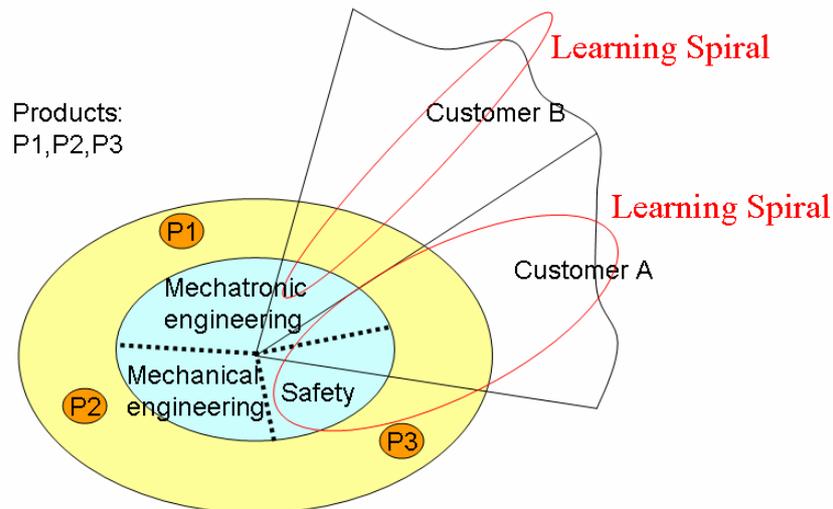


Figure 2: Example – Core Content Strategy in European Skills Portals Development

In **Figure 2** we illustrate the example of a European strategy (EU Certificates, PLATO, MMPS) where a base system with skills set structures and functionality to support skills assessments and exams for European professions is developed one time and adapted to many professions. The learning spiral is then driven by the professions which deliver most ideas how to further increase the base functionality of the system.

In **Figure 3** we illustrate the example of a leading automotive supplier which identified using the analysis that e.g. Customer B would drive the innovation in the mechatronics functions while currently the base knowledge for safety design is created with the idea motor Customer A. Based on the specific team structures are built to further increase this learning spiral.



**Figure 3: Example – Core Knowledge Strategy in Competitive Development**

**Benefits**

Imagine that you either do 30 parallel projects (30 times the effort, 30 different results, 30 maintenance teams, etc.) or that you do one core competence team that provides one solution adapted (by parameters and configuration options) to 30 variants of customers. You can focus knowledge, you can focus resources, and you can focus on customers that are contributing further to the core knowledge.

Projects then start with 80% ready functions and you overtake competitors by a timing of 1:5.

**Relationship to SPICE**

Imagine that you do 30 projects and have to create a tailored process, requirements tree, test plan, etc. for 30 projects. Or that you do this for one core project that contributes to 30 variant projects. You invest one time and it pays back 30 times.

**3.2 Innovation Skills for Distributed Teams Example**

Another key success principle is that organisations are able to model and support the learning spiral (see the learning spiral in Figures 1,2,3) in form of a role based distributed team [1], [2], [3] [4] . This way they learn a so called learning cooperation pattern which can be re-used to dynamically run these learning / innovation partnerships.

Let us continue with the example in Figure 3 and how the core competence for safety design further developed. The company then analyses what are the currently involved roles and the current information flows in that safety related learning cycle.

In **Figure 4** we illustrate the current levels of roles involved in the safety concept, safety design and safety implementation. In **Figure 5** we illustrate the current information flow which showed that there is a bottleneck with the safety manager.

The results of such an analysis would be shown in **Figure 6** where the learning organisation would decide to create a joint learning time to unleash the power of knowledge exchange and collaboration.

**Step 4. Analyse Current Team Roles**

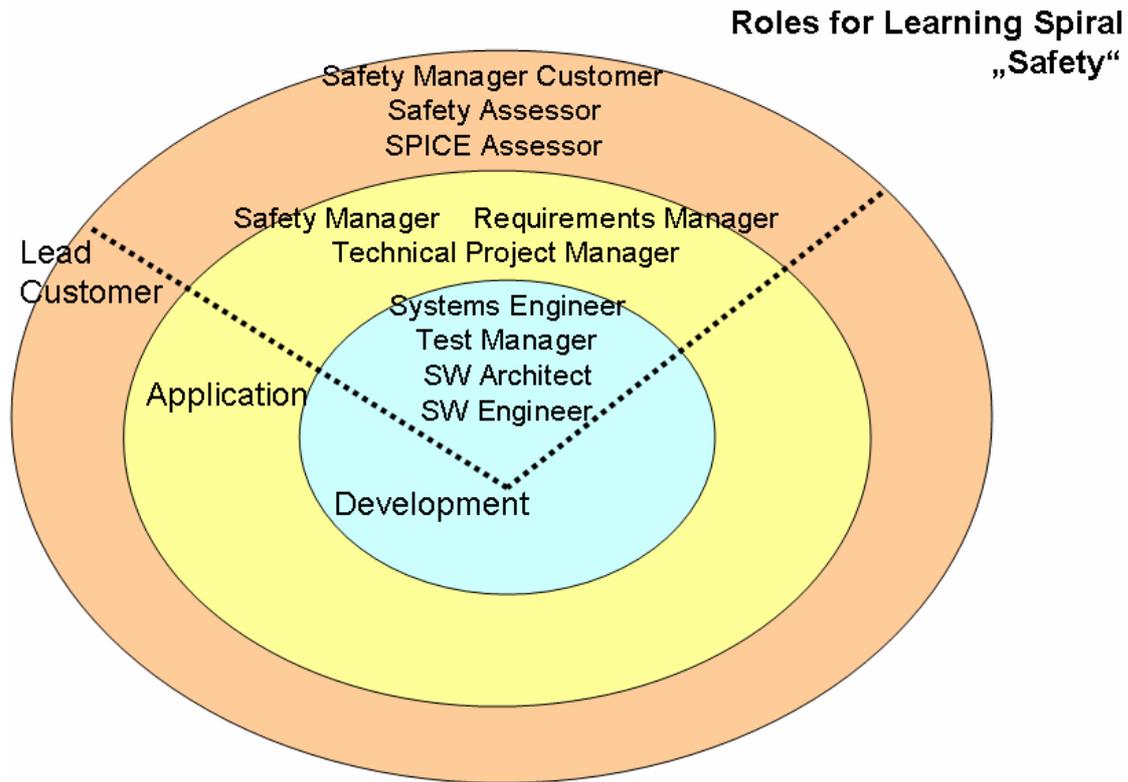


Figure 4: Example – Safety Learning Cycle in Figure 3 –Actual Roles

**Step 5. Analyse Current Team Flows**

**Main information flow, actual situation, simplified**

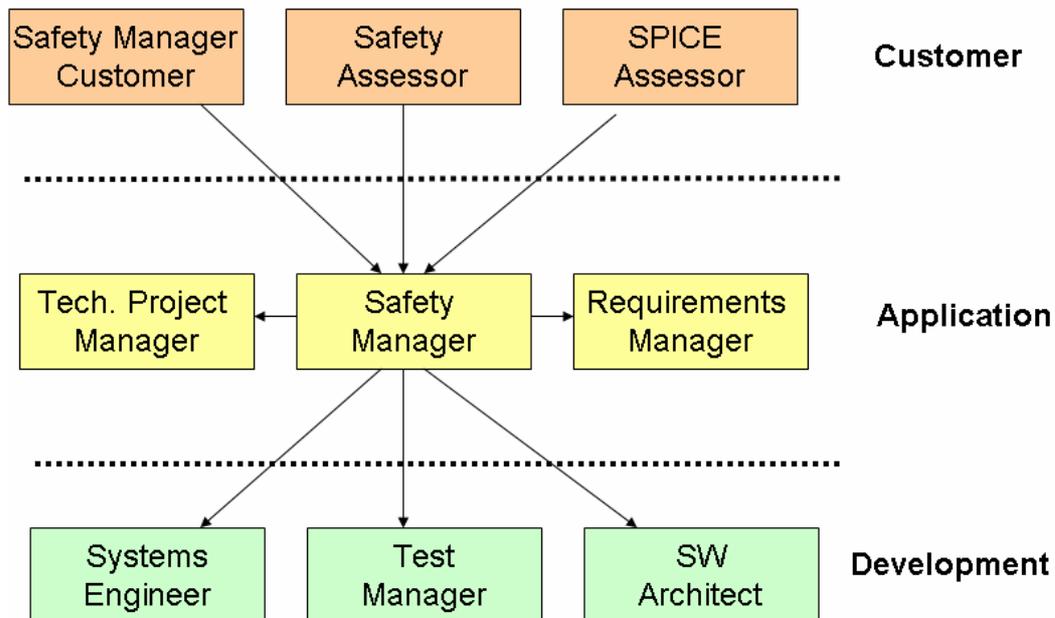
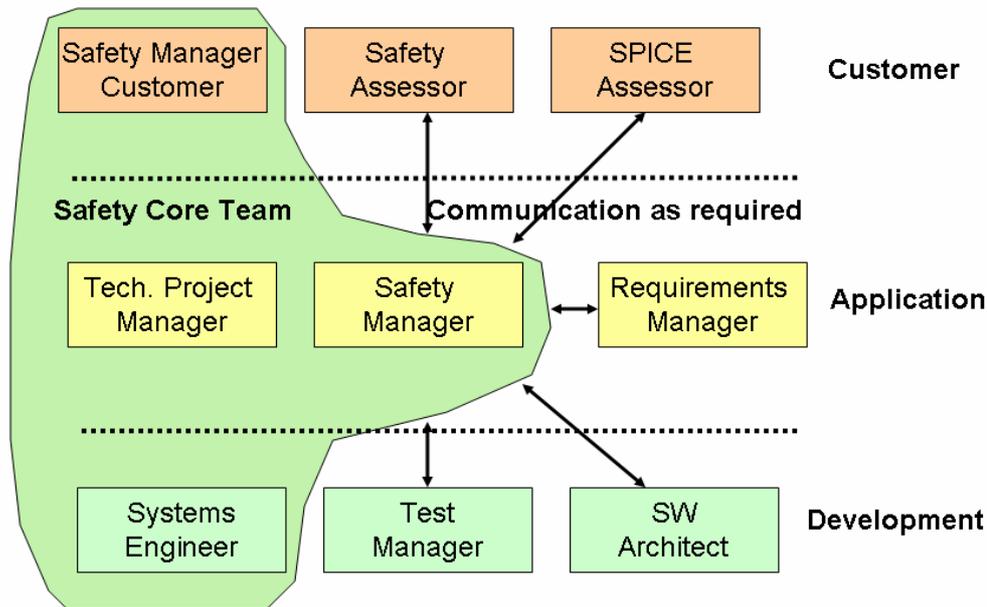


Figure 5: Example – Safety Learning Cycle in Figure 3 –Actual Flows

**Step 6. Improve towards a learning team**

Main information flow, improvement suggestion, team orientation



**Figure 6: Example – Safety Learning Cycle in Figure 3 – Social Team Learning**

**Distributed Innovation / Learning Teams**

A distributed innovation / learning team

- Involves roles from different levels (customer, product, core competence)
- Does not have bottlenecks
- Enables teamwork and feedback loops to create ideas, solutions, knowledge
- Distributes and shares information to the team members

**Benefits**

The learning effect on the core knowledge (safety design in that example) is multiplied by bringing key players together in a learning team. Much information and time is lost when bottlenecks serve in the middle. Also, remember, we need to further increase the dynamics around the learning cycle and the faster it turns the more we learn together on e.g. safety design.

Projects then have access to a quicker generated knowledge base which helps them to re-use that in all variants and further projects.

**Relationship to SPICE**

Imagine that in level 2 assessments assessors always ask about generic practices 2.1.4 to 2.1.6 which relate to team roles and performance. In this case we ask for optimised team structures involving customers, engineering and key staff on e.g. important safety decisions.

### 3.3 Innovation Process Management Example

In most traditional innovation management courses the content relates to patents, supporting new patents, creating idea databases and following up on the ideas, supporting innovative staff, etc.

In learning organisations we add to this traditional picture the organisational strategy of a continuous learning organism around features which keep the organisation alive and leading for a long time.

Therefore another key success principle of learning organisations is the ability to create innovation processes around the learning dynamics of the organisation [1], [3], [7], [9].

#### Feedback Loop Based Innovation / Learning Processes

Feedback loop based innovation / learning processes

- Must represent continuous feedback loops
- Are created based on the learning cycles
- Support the continuous increase of core competence knowledge
- Create critical mass of knowledge to be re-usable in many projects and services

#### Step 7. Create an Innovation Process based on the Learning Cycles

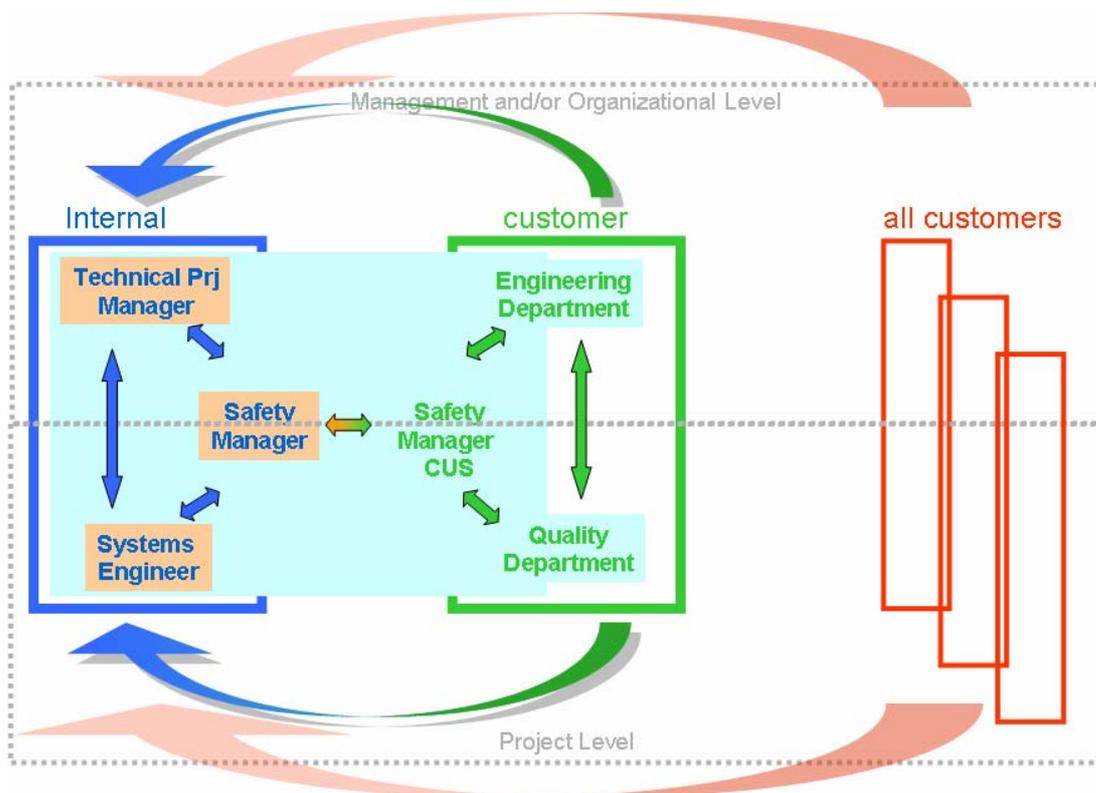


Figure 7: Example – Safety Learning Cycle in Figure 3 – Feedback Loop Processes

In **Figure 7** we illustrate a picture of a designed feedback loop process around the safety core team. Customer and project roles collaborate closely, gather key knowledge prepared and stored by the internal team, and continuously refining the knowledge based on planned feedback loops.

## Benefits

Imagine that you do many projects and each contributes core knowledge and you save it just in the project space. Then the knowledge will stay in each single project and eventually (if a staff member moves to another project) be shared.

Or imagine that you declared certain knowledge as core knowledge, projects share together, and a base structure (product, service, knowledge, requirements tree, etc.) is built for all projects in the centre. Then all knowledge flows together and the feedback loop process is a strategic process in the firm.

## Relationship to SPICE

Imagine that e.g. (to continue with the safety design example) all projects developing a similar function use a different safety requirements tree (with links to tests). Then you must do the same audit and tests many times.

Imagine that you created a safety component used in a group of projects, collect all knowledge in that, then you need one audit, one safety concept with little variations, and one set of tests to be repeated.

## 4. The Grand Strategy

### Learning Organisation Related

The framework for designing a learning organisation has 20 competence areas [9]. Each area has its own success principles. By running through all 20 areas an architectural design for a learning organisation is created.

The training and certificate to learn about these 20 areas (also about how to implement the principles) is being called the "EU Certified Innovation Manager". The certificate is issued by iSQI (International SW Quality Institute).

### ISO 15504 / SPICE Related [10]

Knowledge about these innovation principles is important for SPICE assessors to provide improvement recommendations which help organisations to win from SPICE investments.

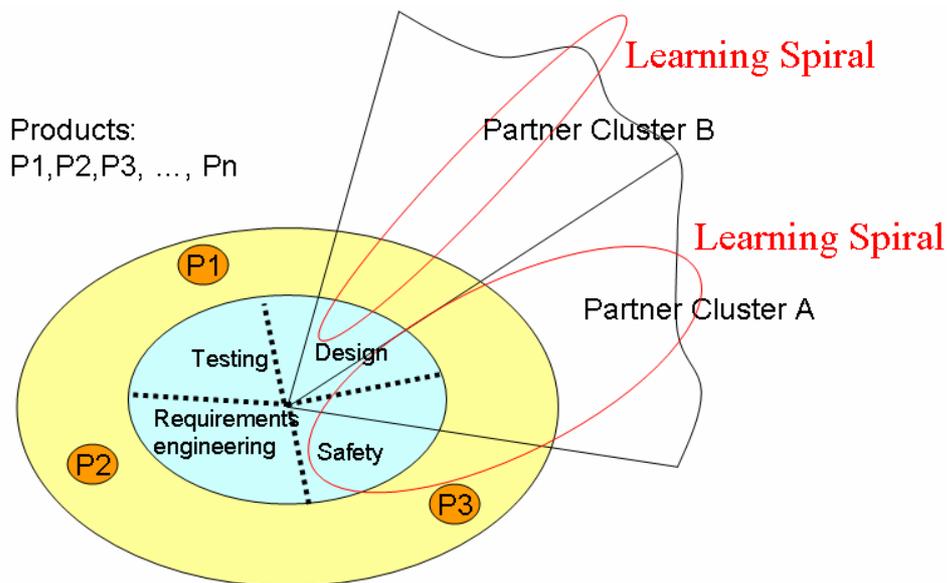
- To know the core competence in functionality in a product segment will help to install the requirements and test traceability for a core functionality once, and then repeat to use it from there. So the investment pays back many times.
- If the understanding of customer, system, and software requirements is demanded, then such learning teams are the basis for such a good communication.
- Innovation is based on a continuous learning cycle involving the customer and core competencies which can be multiplied into many product segments and projects.

### Outlook

Cross company learning teams on core areas of SPICE have been created in SOQRATES 2003 ([www.sogrates.de](http://www.sogrates.de)), where up to now above 20 German leading firms collaborate.

In **Figure 8** we illustrate a picture of the collaborative innovation learning model applied in SOQRATES. Clusters of companies are formed who can contribute key knowledge to a SPICE core competence. Companies can only join on a win-win principle where they give (be a key player to one of the knowledge fields) and take (can access core knowledge elaborated by another cluster team).

Still it is exclusive to be a member of the group because existing members must agree the integration of new members. Thus the core group contributors are no competitors, they exchange and learn from each other, and get together better than their competitors on the market.



**Figure 8: Example – Core Competencies Architecture for Cross Company Task Forces Model**

Using the same innovation learning strategy cross company learning teams on core areas of SPICE have been created also in Austria in S<sup>2</sup>QI 2005, where up to now above 10 leading Austrian firms collaborate.

In 2005 the innovation manager consortium was founded ([www.innovationmanager.org](http://www.innovationmanager.org)) which is now continued to be supported by the EU in EU Cert (2008 – 2010, [www.eu-certificates.org](http://www.eu-certificates.org)).

If you plan to participate in a training partnership then contact iSQI ([www.isqi.org](http://www.isqi.org)).

## References

- [1] M. Biro, R. Messnarz, A. Davison (2002) The Impact of National Cultures on the Effectiveness of Improvement methods - The Third Dimension, in Software Quality Professional, Volume Four, Issue Four, American Society for Quality, Sep-tember 2002
- [2] Feuer E., Messnarz R., Wittenbrink H., Experiences With Managing Social Patterns in Defined Distributed Working Processes, in: Proceedings of the EuroSPI 2003 Conference, 10-12 December 2003, FTI Verlag, ISBN 3-901351-84-1
- [3] Messnarz R., Stubenrauch R., Melcher M., Bernhard R., Network Based Quality Assurance, in: Proceedings of the 6th European Conference on Quality Assurance, 10-12 April 1999, Vienna , Austria
- [4] Messnarz R., Nadasi G., O'Leary E., Foley B., Experience with Teamwork in Distributed Work Environments, in: Proceedings of the E2001 Conference, E-Work and E-commerce, Novel solutions for a global networked economy, eds. Brian Stanford Smith, Enrica Chiozza, IOS Press, Amsterdam, Berlin, Oxford, Tokyo, Wash-ington, 2001
- [5] A Learning Organisation Approach for Process Improvement in the Service Sector , R. Messnarz. C. Stöckler, G. Velasco, G. O'Suilleabhain, A Learning Organisation Approach for Process Improvement in the Service Sector, in: Proceedings of the EuroSPI 1999 Conference, 25-27 October 1999, Pori, Finland
- [6] R. Messnarz, et. al, Assessment Based Learning centers, in : Proceedings of the EuroSPI 2006 Conference, Joensuu, Finland, Oct 2006, also published in Wiley Interscience Journal, SPIP Proceeding in June 2007

- [7] G. Spork, et. al, Establishment of a Performance Driven Improvement Program, in : Proceedings of the EuroSPI 2007 Conference, Potsdam, Germany, Sept. 2007, also published in Wiley Interscience Journal, SPIP Proceeding in June 2008
- [8] R. Messnarz, et. al, Human Resources Based Improvement Strategies – the Learning Factor, in : Proceedings of the EuroSPI 2007 Conference, Potsdam, Germany, Sept. 2007, also published in Wiley Interscience Journal, SPIP Proceeding in June 2008
- [9] Messnarz R., et. al., ORGANIC - Continuous Organisational Learning in Innovation and Companies, in: Proceedings of the E2005 Conference, E-Work and E-commerce, Novel solutions for a global networked economy, eds. Brian Stanford Smith, Enrica Chiozza, IOS Press, Amsterdam, Berlin, Oxford, Tokyo, Washington, 2004
- [10] ISO / IEC 15504 Standard, Parts 1-5

ORGANIC - Continuous Organisational Learning in Innovation and Companies

### **Dr Richard Messnarz**

Dr. Richard Messnarz (rmess@iscn.com) is the Executive Director of ISCN LTD. He studied at the University of Technology Graz and he worked as a researcher and lecturer at this University from 1991 - 1996. In 2 European mobility projects (1993 and 1994) he was involved in the foundation of ISCN, and he became the director of ISCN in 1997. He is/has been the technical director of many European projects:

PICO - Process Improvement Combined Approach 1995 - 1998,

Bestregit - Best Regional Technology Transfer, 1996 - 1999,

TEAMWORK - Strategic Eworking Platform Development and Trial, 2001-2002,

MedialSF - Eworking of media organisation for strategic collaboration on EU integration, 2001-2002

He is the editor of a book "Better Software Practice for Business Benefit", which has been published by IEEE (www.ieee.org) in 1999 (the leading research publisher in the USA). He is the chairman of the EuroSPI initiative and chair of the programme committee of the EuroSPI conference series.

He is author of many publications in e-working and new methods of work in conferences of the European Commission (E-2001 in Venice, E-2002 in Prague), and in the magazine for software quality (Software Quality Professional) of the ASQ (American Society for Quality).

He is a lead ISO 15504 assessor. He has worked as a consultant for many automotive firms, such as BOSCH, ZF TE, ZF N, Continental TEMIC, Audi/VW, etc. He is a founding member of the INTACS (International Assessor Certification Scheme) accreditation board, a founding member of the Austrian Testing Board, a founding member of the Configuration Management Board, and he is the technical moderator of the SOQRATES initiative ([www.socrates.de](http://www.socrates.de)).

### **Dipl. Ing. Gunther Spork**

Gunther Spork has a Master of Science degree in mechanical engineering from the Technical University at Graz.

He has a long experience in a wide area of improvement. After starting as manufacturing engineer for VA TECH Hydro he joint a Six Sigma Team which was responsible for deploying a Six Sigma pilot structure in 1998. Beside being in charge for the Six Sigma project success in the Generator Division as Master Black Belt he was also responsible for the Six Sigma training program and trained colleagues from 3 continents. Additionally he participated in strategic projects of the VA TECH Group.

In 2001 he started to work for Magna Powertrain in Lannach and was responsible for the Management System according ISO TS 16949 and Six Sigma. Later he took over the responsibility for engineering processes and development methods. In this function he is also responsible for the deployment of SPICE. The aim for improvement goes along with

internal and external ISO 15504 assessments according automotive SPICE regulations.

**Dipl. Ing. Damjan Ekert**

Dipl. Ing. Damjan Ekert is the chief developer of the Capability Adviser and EPI / Learning systems since 2003. He studied Telematics in Austria and finished studies with distinction. He is a certified ISO 15504 assessor and works in consulting projects for Magna. He is the project leader for software development inside ISCN.