Applying Organizational Learning to Enterprise Knowledge Maturing

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Abstract: We first describe the state of the art of organizational learning, mentioning the theories and types of it. The need of organizational learning, contributing processes and the main processes are further explained. Various methods of organizational learning are introduced. A template for a short description is proposed, which gives an overview about existing methods. The template then offers the possibility to indicate which method can be applied on Enterprise Knowledge Maturing.

Key Words: organizational learning, methods of organizational learning, types of organizational learning, processes of organization learning, organizational learning views, dimensions of knowledge potentials, method template

Category: L.0.0, L.3.4, M.1, M.3

1 Introduction

In today's fast-paced world, innovation and development speed has become extremely important for successful business. The fundament of innovation is knowledge as a result of learning [Pautzke, 1989]. The learning attitudes of organizations are known as Organizational Learning (OL). OL has already become popular since a quite long time. The basis has been described by [Argyris and Schoen, 1978], who defined OL as "the awareness and correction of mistakes". Later, [Fiol and Lyles, 1985] defined learning as "the process of enhancing of activities through better knowledge and understanding". They described that OL leads further through development of complex interactions than the sum of individual learning. [Dodgson, 1993] mentions that learning is essential for the maturing knowledge of a single person but also for the whole organisation. [Probst and Büchel, 1997] defined OL based on the systems theory as the "interaction between individual and organization". Further views on OL have been defined by [Prange, 1999], [Lave and Wenger, 1991] and [Beck, 1997].

1.1 Relationship between Individual, Group & Organization

The approach of [Sessa and London, 2006, p. 6] describes the importance of the relationship between individual, group, organization and environment. Organizational learning builds on group learning which again depends on individual learning. How they contribute to each other is also mentioned in [Brass et al., 2004].

Preconditions for continuous learning are the environment's need for change and the system's readiness for change. If the system is ready and the need is high, a desired result might be achieved; otherwise frustration, learning failure or standing at a status quo will be the result.

The definition of individual, group and organization are given to support the understanding of the relationship between the methods and the three different elements.

- An **individual** is a single person.
- A **group** is a team, e.g. in a project, with a defined start and end.
- We defined an **organization** as an enterprise, a department or division.

2 Types of Learning

[Argyris and Schoen, 1978] defined learning as the detection of errors. They introduced tree types of learning:

Single-loop learning (adaptive learning) : Single-loop learning occurs when errors are corrected and detected within a given set of governing variables like policies and goals.

Double-loop learning (shift / generative / proactive learning) :
Double-loop learning occurs when additionally of detecting and correcting errors, norms and policies will be adapted and improved.

Deutero learning (learning how to learn / transformative learning) :
Deutero learning occurs when double-loop learning and single-loop learning is under revision.

3 The Trigger for OL and how to support it

As described in [Sessa and London, 2006], the need for OL appears in different situations and there exist various models for organizational change and development. Different processes support the OL. On the one hand, some processes of an organization contribute to organizational learning. These supporting processes can be developed and adjusted in a way they optimally support OL (see 3.2). On the other hand, OL processes exist which handle the information and knowledge management inside an organization and its elements (see 3.3).

3.1 The Need for and the Development of OL

Different situations may drive the need for organizational learning. A few among others are changing governmental situations, economic downturns and economic fluctuation in general, expansions, acquisitions or mergers, where a national

company evolves into a multinational enterprise and is confronted with a variety of law and business practices or changing competition on the marketplace.

Learning is often involved with the change and development of an organization. That might affect processes, policies, hierarchies, structure, communication practices, products and goals of organizations. The development is linked with a progression through different stages of learning. Such steps are introduced in the MATURE-Project and the proposed dimensions of knowledge potentials [Brun et al., 2008].

3.2 Contributing Processes to OL / (Organizational Capabilities)

Different processes in an organization support OL, also mentioned in [Argyris and Schoen, 1978]. OL can occur when individual and group learning is embedded into routines, structure, culture and the strategy of organizations. The following contributing processes are strongly linked to each other.

Development of the strategy: As mentioned in [Sasser2006: 160], members of an organization often have a shared vision. Therefore every individual has a collective view of how the organization should work.

Development of the organizational structure: The structure has to ensure that OL is supported with enough resources, i.e. the right people at the right place at the right time.

Development of the organizational culture: [Argyris and Schoen, 1978] propose two different Models I and II to describe mental models. In Model I leaders don't accept feedback, where in Model II the behaviour is open to others, evaluating comments and trying alternative actions, what constantly leads to organizational learning.

Development of the personnel: The leaders of a company are powerful promoters of an organization and should use their archetype function to drive an organization towards a learning orientation, by being a continuous learner.

3.3 OL Processes

[Huber, 1991] describes four processes and corresponding sub-processes which contribute to organizational learning and handle the knowledge management. An iterative process may continuously improve each of these OL processes.

Knowledge acquisition: Through the acquisition of knowledge, the organization is able to learn.

Information distribution: The distribution of information is the process where information is directly shared amongst units and employees, also in informal ways [Brown and Duguid, 1991].

Information interpretation: Received information must be interpreted. Individuals have different information background and formation of knowledge and therefore might interpret the information in different ways.

Organizational memory: Knowledge has to be stored in repositories for future use, also called "Corporate Knowledge" by [Hamel and Prahalad, 1994].

4　Methods of OL

There exist different methods of organizational learning with different input, output and stakeholders, from very simple to more complicated ones. A collection among the various methods that exist for OL are first listed in a table (see table 1) and then shortly described. They should give a good overview about the possibilities of existing methods. Later on we propose a template for describing each method, where we exemplary describe the Open Space Method.

	Individual	Group	Organization
Individual Feedback	x		
Buddy System	x		
Mentoring	x		
Coaching	x		
Job Rotation	(x)		x
Knowledge Groups		x	
Catalogue of Strenghts and Weaknesses (SWOT)		x	x
Story Telling		x	x
Lessons Learned		x	x
Knowledge Landscape		x	x
Open Space Method		x	x
Pensioners System			x
Best Practices			x
Ideal-Organization			x

Table 1: Header: Who will be affected / Whose knowledge will mature; Rows: Different method of OL

4.1　Method Description

Thanks to **Individual Feedback**, an individual can recognize the effects of its actions and choices, and realizes continuous learning through the adoption of activities, to change from negative to positive output. Without feedback, organization members cannot evaluate whether they should repeat their behaviour or modify it, accordingly no learning occurs.

In a **Buddy System** two people operate, monitor and help each other. They

may work as a single unit and both benefit from an increased knowledge base.

Mentoring is quite similar to the buddy system. Two persons have different experience- and hierarchy-levels, but the relationship is not based on superior and employee. Also if the more experienced person may have a role of a godfather, professional and personal knowledge can mature for both of them.

Coaching is a stronger version of mentoring. A professional coach trains individuals but also groups, by using assessments, setting goals, focusing on plans, behaviour and further instruments.

Job Rotation: If employees switch for a predefined time to another job, they get a different view of how things are done. It mainly supports organizations to mature knowledge, as the exchanging employees interchange knowledge, but also the individual's knowledge is being enhanced.

A catalogue of **Strengths and Weaknesses** will be identified, which can be used to identify the room for improvement. (The other part of the SWOT-Analysis, Opportunities and Threats, consider the external factors).

Knowledge Groups: Employees doing the same or similar work meet periodically to talk about how they do their work. Problems and possible solutions are discussed; best practices may be an output of such groups.

Story Telling: Performing this method, a story teller explains implicit knowledge often in a form of a metaphor, sometimes supported by music and images. The talker explains a situation based on its experience, the audience listens to it to adopt the behaviour but also to scrutinize the procedure.

Lessons Learned: Often after a project some lessons learned are made explicit. These help for further work not to fall into same traps and to continuously improve standard procedure and other tasks, which leads to an organizational knowledge maturing.

A **Knowledge Landscape** represents the knowledge inside an organization. It helps to locate experts and to identify holes of missing organizational knowledge expertise.

The **Open Space Method** can be performed with any group size. Initiators, which can be anyone, have some proposals or ideas. If many ideas exist, they will be clustered. Then working groups find together and formulate the result.

Every participant of such a group can feel free to switch to another group during the development of the results. The results are all putted on a wall, so that everybody can read and discuss about them. At the end, all results are taken together, and in the plenum the best of them are evaluated, for which new groups can be formed who concretise the ideas and which are presented on a later stage.

Pensioners System: Applying this method, former employees, already in their pension, are fetched back for different reasons. This could be the lack of experts on the labour market or the missed circulation of information.

Best Practices are written down so that anyone has access to them and can perform best practices. Basis for best practices is acquired and matured knowledge. Some input might be supplied by the knowledge groups.

Ideal-Organization: Each member of an organization should present his view of the ideal organization. This helps for the further development of the vision of an organization and shows the wishes of each individual.

4.2   Method Template

The template (see figure 1) consists of attributes which have to be described for every method used in OL. The following section describes how it should be used. Starting from the top, the template indicates whether

- a method can be used for an individual, a group or an organization,
- for which type of learning it is appropriate (single-loop, double-loop, deutero learning) and
- in which of the aforementioned OL processes it is applicable.

Then, each attribute of the template consist of several related questions which should be answered. Once for each method the template has been filled,

- it firstly helps to get an overview about the various methods and helps to structure them.
- Secondly, by considering pre- and post-conditions, the relationships between the methods can be identified.
- This then thirdly indicates which method can be used in a given situation of an organization and serves as a reference.
- The task & goals and benefits attributes answer the question why a certain method should be applied.
- The whole description also provides information on how and where a method can be used.

Method-Name				☐ Ind ☐ Grp ☐ Org
Type: ☐Single ☐ Double ☐Deutero	**Process:**	☐☐☐☐☐Acq.	☐☐☐☐☐Distr.	
		☐☐☐☐☐Interp.	☐☐☐☐☐Store	

Pre-conditions (entry criteria) / Trigger (int. / ext.)
- Which are the triggers for applying this method?
- Are the triggers intern (strategy, expansion, …) or extern (from technology, government, economy, marketplace)
- Conducted pre- methods as entry criteria?
- Further entry criteria?

Tasks & Goals
- What are the tasks that have to be performed?
- Do the tasks have to follow a specific order? Have they to be repeated?
- Which goal should be reached?

Utilities
- Which additives are needed?
- Which ones are mandatory, which ones are optional?
- How do they support the method?

Constraints
- Which constraints have to be considered for performing the method?
  - Former (positive/negative) experiences of employees?
  - Time constraints? Minimal, Maximal duration?
  - Group size?
  - Location?
  - Needed skills of the participants?
  - Needed skills of the host (e.g. moderator)?

Affecting / Support for (strategy, structure, culture, personnel?) (ind./grp./org.?)
- The maturing of which part of the organization is affected?
- Which part is supported?
- Who will be affected?

Post-conditions (exit criteria)
- What has to be achieved to successfully complete the method?
- Do Pre-conditions of further methods have to be considered?

Benefit
- What is the benefit for the individual, group and/or organization?
- How do they mature?

Reasons for not using the method
- Former bad experience of employees?
- Conflicts, regarding to the given constraints?
- Unwanted post-conditions?

References
- References to artefacts where the method is further described

Figure 1: Method template

The proposed template is related to the pattern language which was introduced by [Alexander et al., 1977] as follows: "Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice. [Alexander et al., 1977]" On these grounds, [Fricke, 2000] introduced with the 'Pedagogical Pattern Maps' a similar method for the education field.

As an exemplary method, the Open Space Method is described with the OL-template (see figure 2).

Open Space Method		☐ Ind ☒ Grp ☒ Org
Type: ☐Single ☒ Double ☒Deutero	**Process:** ☒☒☒☒Acq	☒☒☒☐Distr.
	☒☒☐☐☐Interp.	☐☐☐☐☐Store

Pre-conditions (entry criteria) / Trigger (int. / ext.)
- No bad experiences with this method from participating employees
- Trigger to take ideas from nearly every individual

Tasks & Goals
- Introduction Phase a. Present the method b. If not already done, look for methods c. Clustering of topics by finding similarities, if necessary
- Working Phase a. Working groups are formed b. They formulate results which are put on a wall so that everybody can read them c. The results can be discussed
- Finishing Phase a. All results are collected and put into one document b. Decide about which ideas should be further considered, based on the number of nomination as well as the importance and other factors c. Enhance the ideas in working groups into concrete tasks, goals, visions d. Present the developed ideas in a the audience and decide about further development
- The goal is to have a set of further steps which have to be done, might also be a proposal for the future strategy or other output

Utilities	
- Room	- Paper
- (optionally copier)	- Moderation cards
- (optionally notebook)	- (optionally glue)
- (optionally camera)	- (optionally cutter)
- Pin board	- Small rooms for "expert groups"

Constraints
- The number of employees is open
- The method must be explained to all participants
- The duration of the collection of ideas should just take as long as useful ideas come up and the employees are not bored
- The location has to be adequate to perform a successful idea collection but to also have the possibility to work on in smaller groups

Affecting / Support for (strategy, structure, culture, personnel?) (ind./grp./org.?)
- The method can be performed for the group or the organization
- It might mainly affect the strategy, but also the personnel, which is able to bring in their ideas

Post-conditions (exit criteria)
- As soon as next steps are chosen the exit criteria is reached
- The output should be in a form so that it can be used for further steps; it must therefore be easy understandable

Benefit
- The group or organization matures thanks to new input
- The individual feels respected and more committed to the group or organization

Reasons for not using the method
- Not enough time
- Former bad experience of employees

References
- http://www.np-strategie.de/aktuelle_downloads/OpenSpace.pdf
- http://wwwcs.uni-paderborn.de/schulen/sem/downloads/openspace.pdf

Figure 2: Exemplary method: Open Space method

5 OL Methods supporting "An integrated Approach to assess the Potential of an Enterprise to mature Knowledge"

5.1 Assess the Potential of an Enterprise to Mature Knowledge

In [Brun et al., 2008], an "integrated approach for assessing and maturing enterprise knowledge with regard to various dimensions" is proposed. This knowledge management radar "could serve as a management dashboard for showing the as-is-state, to justify the direction as well as the extent of future knowledge management activities". The six dimensions of the radar are defined as shown in figure 3:
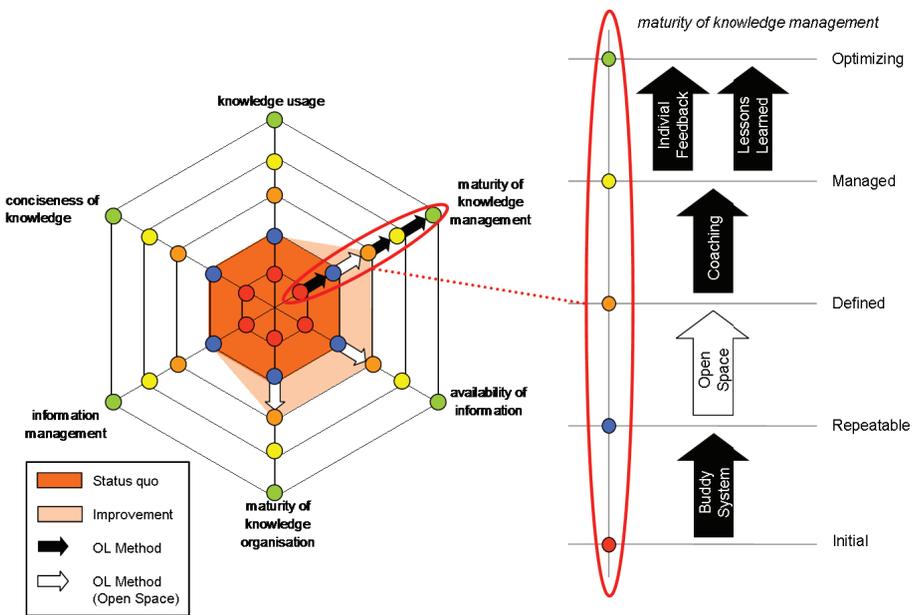

Figure 3: The six dimensions of knowledge potentials and an exemplary OL Enterprise Knowledge Maturing Path extended from [Brun et al., 2008, p. 3]

For each dimension, five steps are defined which represent the knowledge maturity in the specific dimension. As described in [Brun et al., 2008], the **Knowledge Usage dimension** "assesses the integration of knowledge management activities into the operational work." The levels start from 'General-purpose storage and retrieval' up to 'User-specific and context-adapted knowledge assistance'. The **dimension of Information Availability** "comprise levels from

'Explicit documentation' up to 'Automated Metadata Generation'." The **dimension Maturity of Knowledge Organisation** "leads from Keywords to Ontologies. Knowledge organisation deals with (1) building and modelling systems of concepts as well as (2) their mapping to subjects of reality. Methods for knowledge organisation can be arranged in a spectrum with increased semantics." The dimension of **Information Management** "considers the structure, security, redundancy, integrity on conflict resolving of information and classifies five constructive levels from 'Structure' to 'Conflict solving and continuous proactive development'." Another dimension for measuring the maturity of knowledge is the **Conciseness of Knowledge**. Here "the quality of content and an adequate representation are investigated."

5.2   Adapting OL Methods to Enterprise Knowledge Maturing

Our method template supports the Enterprise Knowledge Maturing (EKM) approach by indicating which method of organizational learning supports the maturing process in a specific dimension on a specific level. It therefore indicates how an organization is able to progress from one level to another. To clarify we give an example of an enterprise which is, based on its own evaluation, situated on Level 2 on all dimensions as shown as status quo in figure 3. We now apply the Open Space method as described in detail above. This method is useful for organizations which stand in such early stages of knowledge maturing and can be applied to three dimensions: The maturity of knowledge management, the availability of information and the maturity of knowledge organisation. After performing the Open Space method we can assume that the organization has reached the next level in these dimensions, or has at least evolve in this direction, as shown with the improvement area in figure 3. Note that beside a dominant dimension also other dimensions are affected in a moderate way.

Reaching the next level depends on several factors like the status before and the correct application of the method among others. It must also be considered that OL methods or OL in general might not help in every possible stage an organization can be situated in to achieve a next level. As mentioned before, OL methods can support the maturing process in a specific dimension on a specific level. Figure 3 shows on the left-hand side on the dimension 'maturity of knowledge management' an example of a possible path of using OL methods. Not every OL method can be used at every level of enterprise knowledge maturing. The introduced method template supports the method selection process. As we see in the exemplary OL-path on the right-hand side in figure 3, it is even possible to use more than one method at a specific level. It could also be the case that a selected method has a precondition that another method has to deliver as an input in advance.

5.3 Prevent Enterprise Knowledge Contraction

As explained in section 5.2, the orgnization is situated on specific levels in each of the dimensions. A reached level is obviously not a stable state. Therefore it should be another target to stay on the actual enterprise knowledge maturing level. OL methods like Job Rotation, Buddy System, etc. can be used to stay on a specific level.

6 Conclusion

The term 'Organizational Learning' has been defined in different ways and for different purposes. By providing a method template we want to give an overall view about existing OL methods and their possibilities. The description of the methods indicate how they can be used, for which actor and in which context. The template also integrates the types of learning, the supporting processes and the OL processes, described in the state of the art part. This information should help to choose the most appropriate methods for an organization situated in one of the seven dimension of knowledge potentials on a specific level. Applying the suitable method will therefore help to reach a next level and mature the knowledge.

7 Future Work

A description of all the methods with the given template will represent a reference list of all relevant methods, including their pre- and post-conditions, tasks, constraints and further information. An 'OL-EKM-Map' (see figure 4) similar to the 'OL-EKM-Path' on the right-hand side of figure 3) can be created mainly by using the pre- and post-conditions of the methods. This helps organizations 1) to find needed appropriate methods, 2) to understand which methods already must be adapted in the organization to use a more developed one, but also by showing which methods are more appropriate in earlier or later stages, and 3) to inform for which group size the methods can be used. Such a map could be implemented without much effort in a modelling tool like ATHENE [Hinkelmann et al., 2007] by designing a meta-model for it. Using a meta-model, the map can easily be adapted for the needs of individual organizations. Such a map will also be able to indicate missing methods in the organization.
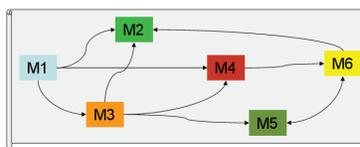
Figure 4: Organizational Learning - Enterprise Knowledge Maturing - Map (OL-EKM-Map)

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