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ALIGNING BUSINESS AND LEARNING: COMPETENCY BASED LEARNING MANAGEMENT IN ORGANISATIONS

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Abstract

The value of human capital strongly influences competitiveness, making the alignment of training and business objectives a key priority for organisations in today’s turbulent markets. This entails integrating learning into daily working tasks and putting in place mechanisms for the effective management of business processes, organisational roles, competencies and learning processes, to reduce the time to fill competency gaps and to build proficiency according to evolving business needs. In this paper we discuss competency-based learning management and a practical implementation of this approach in the context of the PROLIX project for business process oriented learning.

Keywords: *E-learning, Competency Development, Business Processes, Competencies, Time2Competency*

1 THE NEED FOR CONTINUOUS COMPETENCY DEVELOPMENT

Modern organisations are constantly changing under the transformational effect of emerging technologies and the rise of the “knowledge economy” (Brinkley, 2006). In addition, the increasingly competitive new global economy has a significant impact on the nature of the workplace, changing the way people work, the jobs they do and the competencies required (OECD, 2007; Accenture, 2006). Personal skills are quickly becoming outdated and new ones are called for in today’s increasingly information-driven “high performance” organisations. With competency requirements rising rapidly and constantly changing, the skill level of employees must be continuously developed. It therefore becomes imperative for companies to invest in developing competencies, in order to avoid their employees lacking the skills and knowledge that the global market demands.

The value of the organisation’s human capital strongly influences competitiveness. Economic success is linked to “the effective utilisation of intangible assets such as knowledge, skills and innovative potential, as the key resource for competitive advantage” (Brinkley, 2006). According to Peter Senge (Senge, 1994) the only sustainable competitive advantage an organisation has is its ability to learn faster than the competition. A learning organisation should be capable of aligning its strategic objectives and vision with the competencies of its employees and foster continuous learning for continuous personal development and improvement. Training should transfer to employees all the knowledge needed to cover any deficits hindering the independent fulfilment of their daily business tasks. In this context, workplace learning, both formal and informal, is taking on an increasingly important role as a means to increase the innovative capacity, boost productivity and achieve and sustain economic success in enterprises.

Nonetheless, while learning (Nonaka & Takeuchi, 1995; Senge, P. et. Al, 1994; Grace & Butler, 2005) and business management activities (Hammer & Champy, 1993; Davenport; 1993; Davenport & Prusak, 1998) essentially serve the same goal (i.e. to improve the operational effectiveness of the organisation), they are traditionally handled by organisations as two completely disjointed activities. **Aligning training to organisational requirements**, so as to accelerate skills acquisition (“**Time2Competency**”) is an essential step toward “successful” training. Training should be linked to the organisation’s business strategy and integrated with plans and priorities developed in order to address the evolving business and market conditions, such as the need to rapidly respond to market changes and shifts or to introduce new technology, products, services and/or processes. Learning and business processes should be linked

together to form a single value chain through the seamless coupling of related systems, technologies and services.

Training emerges as a critical part of business and should thus form an integral part of the organisation's strategic planning cycle. This entails integrating learning into daily working tasks and putting in place mechanisms for the effective management of business processes, organisational roles, competencies and learning processes, so as to reduce the time to fill competency gaps and to build proficiency according to evolving business needs.

Competencies represent the "connecting link" between business and training. The process of aligning training to organisational requirements involves the establishment of a clear understanding of the organisation's needs in terms of competencies, though the development of **business-focused competency frameworks** and a **competency-based human resources management**, from manpower planning to recruitment and career development.

Competency-based learning management can enable organisations to adapt to changes in their organisational structure (resulting e.g. from business process reengineering and improvement initiatives or from changing business requirements), to effectively introduce employees to new tasks to streamline business operations (e.g. overcome performance problems caused by heterogeneous company culture among different company departments, branches or within project teams as a result of mergers or acquisitions) etc.

In this paper we investigate effective human capital formation from the perspective of the organisation. However, it should be noted that continuous competency development is also imperative from the individual employee's point of view. Employees need to go on updating their skills and abilities throughout their working lives, since raising their skill levels can allow them to better adapt to a changing work environment, increase their personal market value and improve their employment perspective and earnings prospects.

In the following chapters we outline the main characteristics of competency-based training management and discuss the implementation of this approach in the context of the EU Integrated Project PROLIX (Process-oriented Learning and Information Exchange) (PROLIX, 2005) for business process-oriented learning.

2 COMPETENCY-BASED LEARNING MANAGEMENT

Competency-based learning management brings together the formerly isolated domains of learning management and business process management. At present, several applications are used for the purposes of either one of these functional areas (Learning Content Management Systems, Learning Management Systems, Skill Management System, Knowledge Management Systems etc), yet complete overview in the form of cause-and-effect is lacking on both sides.

The quest for gaining and maintaining a competitive advantage is leading to new approaches with regards to how organisations plan, structure and manage their activities. Business Process Management (BPM) is a systematic methodology for improving an organisation's business processes and represents a widely adopted approach for business management.

A business process consists of multiple activities ("tasks"), linked together to form the flow of the process. Tasks are executed by specific job roles that can be assigned to specific employees (Scheer, 2000). BPM activities aim at increasing the efficiency and effectiveness of business processes, as well as their ability to adapt to environment changes, while allowing organisations to model and monitor their business operations.

BPM tools include functions for monitoring business process performance based on specific metrics (such as the number of process instances started, execution times of activities etc), aimed at detecting potential process failure points and predicting work loads for better resource utilisation.

Yet, the competencies of the employees assigned to a business role can also have a significant impact on the quality of the output of a business process. Business process tasks have specific requirements in terms of competencies that need be in place in order for the business process to yield optimal results. Poor performance can often be attributed to bad execution of business tasks by the involved employees due to lacking qualifications, rather than to process-immanent problems.

Nonetheless, currently BPM tools lack support for competencies modelling, failing to systematically capture the competency requirements for a successful business process execution. Business process improvement activities (Business Process Reengineering, Continuous Process Improvement) can create, modify or delete business processes, leading to new competencies requirements to be met by means of training. First the competencies needed to do each process steps have to be defined and matched against the competencies of existing employees, then suitable training measures to new competencies should be identified and proposed to the respective employees.

Competencies refer to the individual's demonstrated capacity to perform, i.e., the possession of knowledge, skills, and abilities and the ability to use these to satisfy the special demands or requirements of a given work task. Competencies represent the "connecting link" between business and training. Despite the work of initiatives such as the IEEE Reusable Competency Definition (IEEE RCD, 2005) and HR-XML (HR-XML, 2004) to define common models and schemas for interoperability, there are still no sufficiently expressive common formats for the representation of competences.

Workplace change is considered a major driver of training in organisations and enterprises (Smith & Hayton (1999); Ridoutt et al. (2002)). Whenever a change in a business process occurs a new learning phase must be launched to fill any knowledge gaps created, in order to meet the new requirements. Ensuring that employees have the right skills for the job is essential for the growth and success of an organisation. Human development processes should therefore be in tune with business challenges. Business-process oriented learning can facilitate:

- Continuous tactical improvement (small scale): This concerns tactical operations (short term decisions and small scale changes) aimed at the continuous improvement of organizational operations (day to day business, incremental performance improvements based on existing resources).
- Goal oriented change (large scale): This relates to large scale changes in corporate strategy and/or goals (e.g. business process re-engineering activities, implementation of a new strategic plan).

As a result of a business process change, job roles may be eliminated, introduced, modified or merged, while there can also be changes in the competency requirements of certain job roles and deficiencies in terms of human resources (personnel allocation or re-location leading to competency deficiencies or a need to upgrade the skills of existing personnel).

The process of aligning training to organisational requirements involves the establishment of a clear understanding of the organisation's needs in terms of competencies, though the development of **business-focused competency frameworks** and a **competency-based human resources management**, from manpower planning to recruitment and career development. This process involves the:

- identification of business-critical competencies needed for the execution of the organisation's business processes
- assessment of current competency gaps
- development of competency improvement plans to meet corporate and individual needs
- optimisation of training investment to target the business-critical competencies
- reduction of the time needed for employees to become productive

Aligning individual training with business priorities, so as to reduce the time to fill competency gaps and to build proficiency according to evolving business needs and daily work processes, emerges as a key challenge for corporate success. In addition, a business-driven analysis of skills deficiencies may reveal untapped potential of the existing staff which can be mobilised to solve a specific business problem.

Another critical element of competency-based learning management is **competency-driven content development**. Learning should be integral to the workplace, having clear and specific objectives linked to specific job requirements in terms of competency improvements that can be achieved by means of a specific course. Whenever a business process change occurs, a new learning phase must be launched to fill any knowledge gaps to meet the new requirements.

In this context, with the orientation of learning within organisations moving away from past models, the role of the **training department** is also changing. Traditionally, generic organisation-wide training programs have been offered, not necessarily addressing the specific skill needs of individual employees. The systems for planning and executing training programs (Horton & Horton, 2003) are not coupled with business administration tools (business process modelling, business information, performance monitoring systems etc). Executive responsibilities are assigned to different administrative entities. The task of training management is part of the work of human resource managers, who rely on traditional methods in order to assess the training needs of the employees, and often lack a full overview of the actual corporate context in which training is applied. As a result, in many organisations there is a mismatch between the training provided and the actual business needs: training is not provided on time and/or does not fully address the actual training needs of the employees with respect to their changing business tasks.

Instead, organisations should aim to provide training that meets the specific needs and supports the strategy of the business. The main objective of the new training department is to support performance improvement through the timely mediation of the knowledge and skills needed by the employees, in order to successfully execute their daily tasks. For any given job function and any given employee, training managers need to know what the specific training needs are, what kind of training is available, how best to create, organise and provide it and how effective the training will be. All training programs should have **learning objectives**. Learning objectives are critical to measuring learning because they communicate expected outcomes from the training and define the desired competence or performance necessary to make the training successful. Training offerings need to have a clear sense of scope in terms of the competency improvements one can achieve by consuming them. In this light, functions dealing with workplace learning need be more performance and evidence focused. Learning objectives provide a focus for participants to clearly indicate what they must learn, and they provide a basis for evaluating learning.

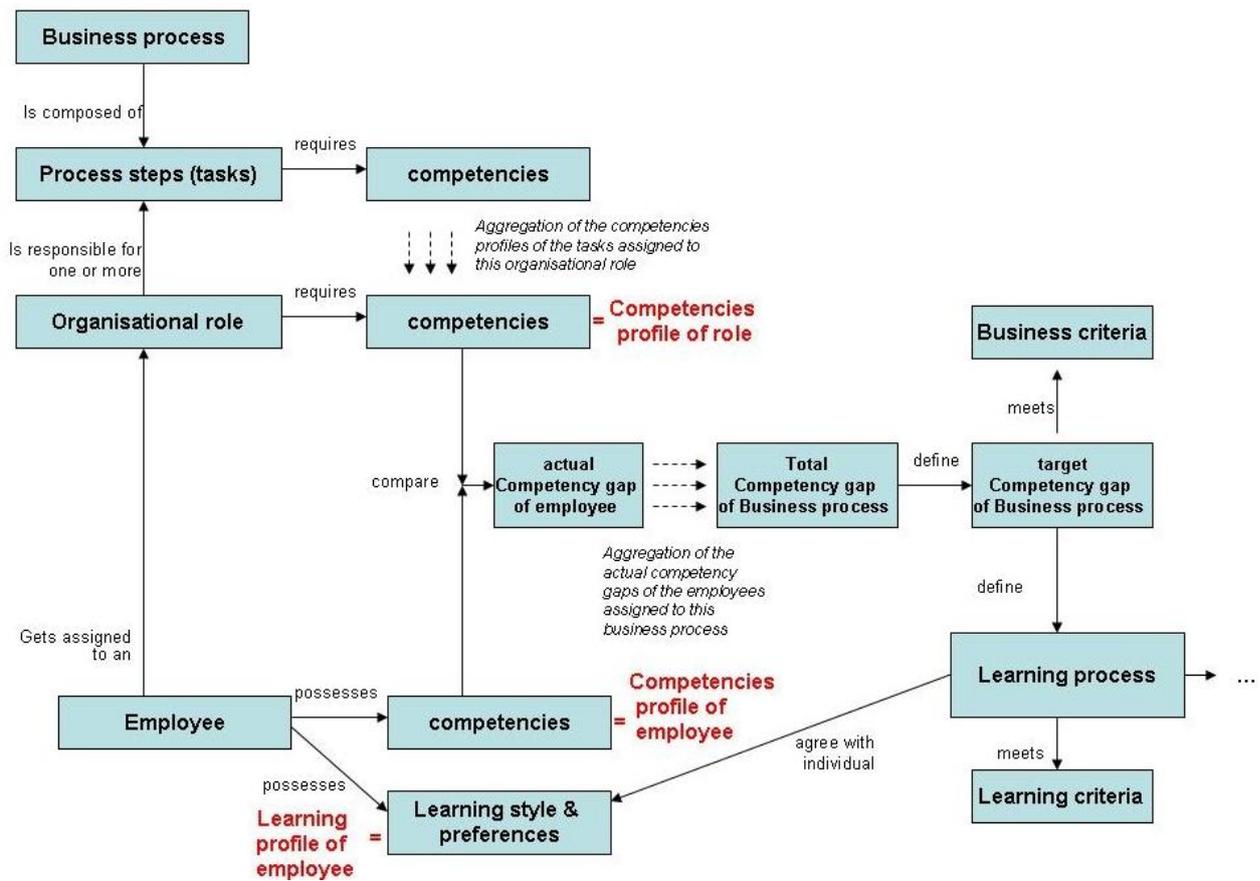


Figure 1. Training goal definition process in the context of competency-based learning management

The evaluation of training includes getting ongoing feedback from all involved stakeholders (learners, trainers etc) to improve the quality of the training and identify if the learner has achieved the goals of the training. It should be noted that for organisations training represents a business decision, an **investment** for which a return is expected in terms of reaching specific business goals and objectives. Ideally learning shall result in a learning outcome measurable as a positive change in knowledge, skills, and attitudes that enhances a person’s competency and has a positive impact on the process outcome and the overall business performance of the organisation.

For the effective management of training, **performance monitoring services** should be put in place to measure the resulting learner performance both in terms of competencies acquired and in terms of effectiveness in solving the original problem, performing the ‘job’ or coping with the (business) process change.

According to Kirkpatrick (1975), in an organisational setting the evaluation of training should comprise four different levels (the "Kirkpatrick levels"):

- **Reaction of student** - What does the learner feel about the training?
- **Learning** - What facts, knowledge, etc., did the learner gain? (the resulting increase in knowledge or capability)
- **Behaviour** - What skills did the learner develop, that is, what new information is the learner using on the job? (extent of behaviour and capability improvement and implementation/application)
- **Results or effectiveness** - What results occurred, that is, did the learner apply the new skills to the necessary tasks in the organisation and, if so, what results were achieved? (the effects on the business or environment resulting from the trainee's performance)

Kirkpatrick's model defined evaluation as meaning "measuring changes in behaviour that occur as a result of training programs". A fifth level, **Return on Investment (ROI)** has been added to this model by Jack J. Phillips (1997), to assess whether there is a financial return for investing in a learning program. ROI serves as the ultimate measure of accountability for both trainers and top executives in organisations.

Performance indicators can be qualitative and quantitative referring to hard figures directly gathered by observing a process financially or operationally (e.g. total inbound costs, time-to-market, training budget, number of courses attended) or "soft data", such as customer satisfaction, perceived knowledge transfer, motivation to learn respectively.

The problem of linking organisational performance, competencies and learning is gaining attention. In the following section we outline the main characteristics of the PROLIX approach for business-driven training that allows organisations to improve their business performance based on a competency-oriented management approach, as developed by a European consortium in the context of the EU-funded IP project PROLIX (PROLIX, 1995).

3 PROLIX: PROCESS-ORIENTED LEARNING AND INFORMATION EXCHANGE

Aim of the PROLIX project for process-oriented learning and information exchange is to bridge the gap between business processes, organisational roles, competencies and individual / organisational learning processes. The project is developing a system to enable business process driven learning at the workplace that builds on corporate requirements and the needs of each single employee/learner.

Linking business processes and learning is a particularly complex task. Business processes define organisational roles and associated functions, each with its own specific competencies requirements (i.e. the "competencies profiles" of organisational roles). From an organisational perspective, learning processes need to be determined based on the lacking competencies of individual employees assigned to specific organisational roles: whenever there is a gap between the competencies profile of an individual assigned to a specific role and the competencies requirements of the role, organisations need to design and execute suitable training plans, in order to close it and avoid any potentially negative effect on business performance. Similarly, they need to anticipate potential competency gaps in newly launched or modified business processes (addition or elimination of process steps, merging of business processes etc). Overall, a deficiency in competencies may be the result of changes in:

- a business process (re-engineering or introduction of a new business process)
- an organisational role and its associated competencies profile (e.g. updating of competencies to match advances in related state-of-the-art, new work methodologies and applying regulations etc)
- the actors, i.e. the individual employees assigned to perform the specific tasks (hiring or relocating personnel, e.g. substitution of employees)

Business situations that may cause such changes include business engineering, recruiting and staffing and regulatory compliance.

The PROLIX project is proposing an integrated approach for process-oriented learning that covers the complete life cycle from the business need that triggers learning to the assessment of the actual impact learning had on business performance. Figure 2 provides an overview of the PROLIX life cycle for process-oriented learning (**PROLIX Learning Life Cycle, PLLC**) and the main tools needed for each step of the process. Starting point is a complex business situation, i.e. a business case that translates into significant competencies deficiencies and creates the need to train employees. The PLLC comprises the following steps:

- **Business need analysis**, which refers to the modelling or optimisation of business processes and the identification of job roles and competencies required to carry out the functions of a business process (Business Process Cockpit & Competency Oriented Simulator).

- The **identification of competency gaps**, which includes the calculation of overall competency gaps (by comparing employee's existing and required competency profiles in the Competency Analyser) and the prioritisation of the competency gaps to be filled by means of learning.
- The **designing of the learning process**, which involves the identification, and in case of lack thereof the creation, of appropriate learning material. The learning material creation process may involve the selection or development of a didactically suitable learning process template (Didactical Learning Modeller) and the assignment of learning resources to this template to create a learning process (Learning Process Configurator).
- The **execution of the learning process**, which consists in employees being trained, in order to fill their respective targeted competency gaps (Learning Process Execution Platform).
- **Performance monitoring**, which involves an evaluation of the impact of the learning process both in terms of learning outcomes and business process performance improvements (Performance Monitor).
- During **business value analysis** the business outcome of the competency improvements is compared against the initial business need. Unless the results are satisfactory, business processes and/or learning processes can be adapted and optimised again and a new PLLC may start.

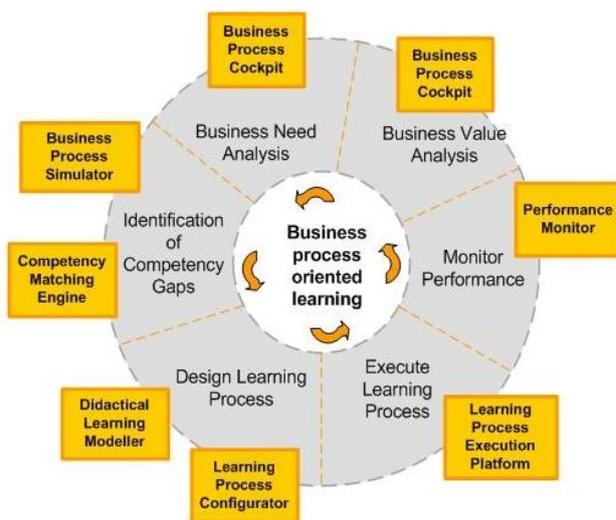


Figure 2. PROLIX Learning Life-Cycle for business process-oriented learning and solution map

The PLLC is usually initiated by management. The involved steps can be performed in sequence or in an order that reflects the actual business need at hand. The full cycle of the PLLC is performed when dealing with a change in a business process (i.e. the improvement of an existing process or the introduction of a new one) or the competencies profiles of the roles. If the business process remains unchanged but there is a change in the actors, the same model applies, although the first stage (Business process modelling) is omitted. The PLLC can also be activated by employees wanting to enhance their employability. An employee may wish to acquire a certain competency either because they believe this will help them perform better in their current position, or in order to apply for a better post within the organisation (personal development in support of internal mobility).

Business process oriented learning calls for competency-enhanced business process modeling. All business processes of the organisation are modelled in the BPC and annotated with competencies in the Competency Analyser. Each job or function in a business process is associated with a set of competencies (a required competency profile), i.e. the competencies an employee assigned to this specific role needs to possess, in order to be able to perform the task satisfactorily. The competencies

profiles attached to individual employees (actual competency profile) are used for matching them with tasks. The difference between the acquired competencies of an individual assigned to a business role (or a candidate for a business role) and the required competencies of the role represent the competency gap, i.e. the needed competencies that are not met by the individual.

Learning requirements are derived directly from the business processes. Following the assignment to roles, the individual learning needs of the selected employees are calculated, based on their competency deficiencies with respect to their roles and tasks (competency development plan). Employees need to be trained only in the areas relevant to their role and in accordance to their individual level of proficiency. The Training Department needs to plan a suitable competency development program, featuring suitable learning offerings. All available learning materials (configured learning processes) need to be defined in terms of competencies: the competency requirements that need to be met for a person to be allowed to join the course and the competences that will be acquired after successful completion. This results in learning offerings being linked to a “required” and an “acquired” competency profile, featuring the required and the acquired competencies respectively. Competencies are specified together with their level of proficiency. The search for suitable learning offerings is based on matching the competency gaps included in a competency development plan against the competencies of the learning course.

PROLIX applies a holistic approach for performance management, measuring the resulting learner performance both in terms of competencies acquired and in terms of effectiveness in solving the original problem. Performance monitoring combines business and learning process control for assessing the value of training from a business perspective (i.e. the impact of learning on the execution of business processes within the organisation). This process spans several areas, involving: learning process monitoring, learning outcome monitoring, competence improvement monitoring, process performance monitoring and business performance monitoring). By processing this data, a visual performance report is generated in the form of a Scorecard (Kaplan & Norton, 1996).

PROLIX builds on a distributed component-based service oriented system, combining loosely coupled and interoperable Web Services.

The PROLIX approach and prototype system implementation are presently in the process of being deployed and validated, in the course of trials with the participation of pilot users from different economic sectors and countries: public administration, publishing, banking, social care, IT industry. The prototype PROLIX architecture implementation combines competency-enhanced versions of existing commercial software systems with additional modules that are developed by the project and are not presently available.

The validation activities undertaken thus far to evaluate the PROLIX approach and the underlying techniques and methodologies have demonstrated that business process oriented learning yields positive results, in terms of increasing the organisations’ agility in managing and executing business processes (cost, time, person-effort and quality issues). By measuring the output of business processes via organisation performance indicators attached to learning and competence activities, this evidence can be made.

4 CONCLUSION

Competency-based learning management provides a holistic approach for organisational learning, featuring a combination of business process intelligence tools with knowledge management, learning design and learning management tools. This allows for business needs to be identified on the spot as they emerge after a significant business change and directly translated to learning, so as to rapidly improve an individual’s performance in the process, as well as the organisation’s overall performance. In addition to identifying the competency gaps of the employees as they emerge, this approach allows for their prioritisation based on business-related criteria, leading to learning plans that maximise the benefit for the organisation (targeted training measures). The measurement of the performance

improvements achieved can help identify new actions for reaching additional operational benefits (a new cycle of business process improvement and learning).

Competency-based learning can have a significant strategic impact in organisations, fostering continuous competency update and renewal, as a means to facilitate continuous tactical improvements and goal oriented changes. By coordinating business process management and learning management activities, organisations can achieve a smooth transition to new business processes and reduce the time needed for revised business processes to become operational. In this context, the time needed to successfully meet the requirements of a given business processes in terms of competencies is expected to be reduced significantly ("time2competence"). At the same time, employees can assimilate new knowledge, improve their competencies and adapt to their new duties more easily.

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