CONTINUOUS WORK BASED LEARNING – CHALLENGES IN A RAPIDLY CHANGING TELECOM INDUSTRY

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Abstract — Work based learning is very essential to maintain a competitive edge in the rapidly changing telecom industry. The time required for establishing a core competence is larger than the lifetime of the applied technology. Line management must consider development of competence as important as development of new products, and close co-operation with educational institutions is important to secure the required dynamics both at universities and in the industry. Formal education should focus on basic, long-term competence, and create a fundamental platform for further work based specialisation. A favourable learning environment at work enables and inspires to continuous competence development that will be strengthened by a competence promotive framework. This framework needs to include technical versus administrative career equivalence in order to secure attractive incentives for individual development.

Index Terms — Core competence, competence management, technical career, industry – university co-operation.

CHALLENGES IN THE TELECOM INDUSTRY

The rapid changes in the telecom industry put very demanding conditions on competence development. Using the development of mobile communications as an example, we clearly see a remarkable change of technology, applications and price level within a very short time frame. Comparing this with e.g. the automotive industry, it is quite obvious that focus on competence strategy is vital for companies in the telecom industry.

At the same time there is a substantial request for improved performance both on the technical equipment and the ability to bring new products into the market.

The other demanding issues are cost and size of the equipment. The industry typically faces an annual cost reduction target of 20%, whereas the size of the equipment should also be reduced by about 20% every year on average.

The consequence is that work based learning becomes very essential, as specific competence obtained through formal education easily could be out-of-date by the time you have completed the period of probation. Competence development is therefore as much the responsibility of the industry as that of educational institutions. The telecom industry needs personnel with adaptive power and development potential combined with an appropriate framework for work based learning. Recruiting personnel only provides a limited part of building new competence in the company.

CORE COMPETENCE

A descriptive definition of core competence is “competence that cannot be established from the time you realise the need until you actually need it”. This definition calls for long term planning and specific awareness on core competence as a corner stone in the business.

As an example, core competence for a wireless company like Nera, includes microwave technology and modem expertise. Engineers with outstanding skills on these lines cannot simply be hired when needed. Newly qualified personnel and even engineers with job experience need a work based training period to be productive. For this training period to be successful and efficient, there must be an existing professional environment in possession of core competence. This environment needs to be maintained through strategic competence management.

COMPETENCE MANAGEMENT

In any dynamic industry, competence management is a key factor to long term success. The competence needed to define product solutions significantly depends on conscious work based learning. Traditionally, line management is limited to project and staff management, whereas human resources and competence development is a relatively vague discipline left to be handled by the corporate personnel department. Such priority is a threat to remain a viable player in the demanding telecom industry.
The learning time-line

A normal learning time-line for engineers and technical personnel with a university degree is typically 10 years of mandatory school, three years high school and 5 years at university or equivalent education. This adds up to 18 years of formal education followed by about 40 years of working life.

Comparing this with the time-line of technology shift in the telecommunication sector is thought-provoking. Without substantial work based training, most managers and decision-makers in the industry will be out-of-date with respect to today’s prevailing technology trends. Assuming that managers typically have more than 10 years of job experience, their formal education dates back to before 1990 (the time before GSM phones became a reality).

Recruiting both from the industry and from educational institutions is important, particularly in a growth period. Formal and organised training has also a significant role, but in the daily round, training at work represents the largest potential for competence building. The stressful reality limits the ability to take part in organised training, and the potential of work based training is not utilised due to lack of proper attention. Consequently, the most obvious and available potential for improved competence is not exploited.

Line management challenges

So, how could this be changed to the better? One key factor is top management focus and expectations. If line managers are evaluated on short-term project development only, the priorities are given accordingly. There is a need for incentives for competence development at all levels in the organisation. Line managers administer not only projects and employees. They administer a competence base that represents one of the most important assets of the intelligence industry. For this asset to yield a good return, maintenance and further development is essential. Consequently, clear demands for competence management should be a primary subject.

Lack of understanding or reluctance towards competence development is generally not a problem in engineering departments. The line managers’ work-load is normally what prevents them from addressing the subject. One should avoid adding another stone to the burden for an already encumbered position. Distribution of management tasks in the organisation could be advantageous both from a work-load point of view and for natural advancements and management competence development in the organisation.

Favourable learning environment

There are a large number of more or less well-defined elements that form the basis of a favourable learning environment in a working situation. Some of them are
focusing on individual conditions, some on collective conditions. Some of these elements are listed here, but this paper will not present a closer description of the individual topics.

- Well defined goals
- Well defined expectations
- New challenges
- Safe job situation
- Meaningful job
- Contact and trust
- Technical support
- Human support
- Guidance
- Evaluation and feedback
- Personal follow-up
- Understanding of relations
- Influence
- Formal rewards
- Informal rewards
- Individual initiatives
- Management involvement
- Employee representatives influence

Rather than deepening the above means for improving the learning environment, two specific aspects deserve more attention; development of technical careers and increased market focus.

**Technical career**

There are too many examples of brilliant engineers who have been promoted to mediocre administrative managers. This results in a frustrating situation both for the engineer and the company, despite the fact that the promotion was intended to be an award for excellent engineering skills in the laboratory. Nobody benefits from a situation where talented engineers are promoted to their own level of incompetence.

Technical versus administrative career equivalence is essential in order to secure attractive incentives for individual development for technical experts. It is extremely important to keep senior engineers in the development group to maintain continuity and get a creative mixture of youthful push and senior judgement.

**Market focus**

Market oriented competence development is essential. With all respect, formal education has limitations as far as market focus is concerned, and close communication with the marketing and sales department is important. By sharing common goals for next generation products and solutions throughout the organisation, the company will have a strong position for future success.

Organisations where either the technology department or the market department has a dominating position, and where the communication between the departments is limited, have difficulties generating a competitive product portfolio. An open and constructive communication and mutual respect for each other’s opportunities and challenges are important ingredients in a powerful and innovative company.

It is important to ascertain that focus on business promoting activities in the entire organisation will be rewarded, formally or informally. Comprehension of the fact that the basis for revenues and profit is generated also in the technical environment is one significant condition for constructive feedback. Particularly unplanned training at work would be more efficient and constructive in such a setting.

**COMPETENCE INTERFACES**

Well functioning interfaces both with partners, educational institutions and the dynamic market is essential for business development in general, and also for competence development. The classical conferences and seminars have their justified existence, but they rarely form a solid competence platform. Continuous competence development depends on long term strategies and accomplishment of everyday planned activities rather than occasional all-out efforts.

![Co-operation with educational institutions](attachment:cooperation.png)

**FIGURE. 3 COMPETENCE INTERFACES**

**Co-operation with educational institutions**

Co-operation with educational institutions, particularly in the local community, has several advantages. First of all it represents a more practical approach to cost-effective and continuous learning. Such a co-operation is also the best platform for recruitment and mutual project teamwork.

Starting by further look on project teamwork, there are numerous opportunities for post-graduate thesis in collaboration with the industry. This could develop into larger commercial projects, and represents a mutual opportunity for the students and companies to feel one’s ways with respect to employment.

Another important point is the utilisation of commercial experience in the educational system. This experience is
highly appreciated in universities and technical colleges. Teaching experience is also valuable in several disciplines within private sector, and the interaction between theory and practice that can be exercised with teachers from the industry is valuable. Adjunct professor and partial college lecturer positions should therefore be promoted both from the institutions and the industry. It is also important that the criteria for filling such positions are in accordance with relevant competence for applied science and skills requested in the industry.

Telecommunications technology could be utilised to ease communication and co-operation. A common wireless communication network with users from both the university and the industry has been established in Bergen, Norway. This network enables efficient and inexpensive broadband communication between institutions and individual students, teachers and industry employees. In this way the network creates new opportunities for improved team-work without limitations on for instance travelling time and office accommodation.

**Co-operation with partners**

Telecommunication networks get more and more complex, and extensive use of partners and sub-suppliers is necessary to implement turn-key solutions. These partners represent complementary competence and most have large development departments with competence that can be utilised to improve the total understanding of total system solutions. This system competence is essential for any player with the ambition to be more than a sub-supplier to large system solutions. Mutual interests in system design and comprehension give grounds for creative co-operation with partners and sub-suppliers.

These partners normally have close relations to educational institutions in their area, and new interactions that enhance the technology base can be established. This kind of networking is an excellent opportunity for enhanced competence building and extension of the technical horizon.

**CONCLUSIONS**

Work based learning is essential to maintain and develop core competence in dynamic industries. Formal education must form the platform for further learning, but can hardly serve the rapidly changing demands for specific skills required in everyday work.

A promotive learning environment is a good investment to secure good return from the development department. This is established by constructive internal communication and co-operation with educational institutions and partners in the industry. Informal work based training has the potential of significant improvement through more attention and organised activities.

Technical careers are required to keep senior personnel in key technical positions rather than in administrative roles.

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