

EMPLOYEE KNOWLEDGE OBSOLESCENCE AND UPDATE IN THE MOBILE TELECOMMUNICATIONS INDUSTRY

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Introduction

Workplaces are among the most rapidly changing environments in terms of Information and Communications Technologies (ICT). This paper first introduces the sources of knowledge challenges brought about by ICT changes, then outlines the basic employee reactions and possible employer solutions, using the telecom industry as the case study given that it is one of the most affected segments (both as a provider and as a heavy user). Finally, this paper describes some of the possible next steps for helping workplaces to overcome the obstacles in frequent ICT changes.

1. General principles of acquiring ICT knowledge

Dr. Anne Russell (Russell, 1995) identified six stages in the learning of new technologies in her case study of “naïve” adult email users. The length of these phases depends on the individual’s capabilities, previous experiences and, of course, personal feelings about new technologies. The identification of these processes has been very important, because as Russell says: “*naïve email users appreciate knowing these six stages*” as it helps them “*realize that understanding will come in time,*” especially in the first stages when frustration and failure are not rare.

One of the industries most affected by ICT change is telecommunications (Hwang, 2003), as it is not only subject to workplace modernization, but it is also a provider of ICT services to other organizations and individuals. The rapid technological advancements in the last two decades in this sector have put great pressure to adapt on employees at all organizational areas (from field technicians to administration staff, from subordinates to top management).

The original stages of knowledge adaptation defined by Russell might not be properly used in the present telecom sector, because:

- a) Here we can no longer consider the average employee “naïve”. In addition to the generally high computer literacy (originating in hiring criteria) in such a high-tech sector, it is also safe to assume that at the technology focused organizational units there are a lot of so called “technological-focused expansive professionals”, a type described by London and Diamante (London & Diamante, 2002) with the main

attributes of “*high self-directed energy*”, “*continuous learning*” and “*action orientation*”.

- b) The technology used in telecommunications is much more complicated than email. Cognitive demands of the new ICT advancements are not understood enough (Torraco, 2002), but there are certain cognitive characteristics of complex technologies identified (as summarized by Torraco also):
- Contingent versus deterministic tasks: decreasingly routine work with more complex and contingent tasks (Pentland, 1997).
 - Distancing technologies: physical separation (i.e. controls, sensor, displays) form the actual monitored phenomena (Woods, O'Brien, & Hanes, 1987; Zuboff, 1988).
 - Stochastic events: randomly raising events (Weick, 1990) and flexible system operations (Norros, 1996).
 - Systemic interdependence: working in a chain or network configuration both from human and technological standpoints (Adler, 1986).
- c) In addition to the initial obstacles of acquiring technological knowledge at the workplaces, it is very important to note the constant change and the subsequent knowledge obsolescence that occur. These changes can further reduce one's willingness to adapt and thus decrease efficiency of learning.

2. Employee reactions to introduction of new technologies

There are two distinct behaviors of employees when facing new technological challenges: acceptance and rejection. (For this purpose ignorance is here considered as a special form of rejection, as it either leads to loss of job or high personal dissatisfaction, which will directly point to rejection or a forced acceptance to avoid the marked consequences). The choice is made considering many factors, e.g. personal interest, ambition, capabilities, opportunities and even the overall suspected economical situation of the firm (i.e. can layoffs be expected or not).

The support from employees is highly dependent on the type of new development the company tries to introduce (Zwick, 2002). Previous studies (Daniel, 1987; Daniel & Hogarth, 1990) have already shown that changes in organization of work on it's own (independent of technological investment) triggers higher resistance than technological innovation introduction on it's own. Zwick has proven the validity of the following three main hypotheses:

- 1) Employee resistance is higher in firms that face negative business prospects;
- 2) The impact of expected employment reduction on internal resistance against innovation is stronger for lower qualified employees than for higher qualified employees;
- 3) Employee resistance is higher in firms that plan to introduce other innovations or organizational changes.

The first effect is especially critical in the telecommunications sector not just internally, but externally (customer perspective) also, as in a non-, or slowly-growing global economy many of their new services struggle to find the required scale of business. Also, the telecom industry worldwide has been heavily prone to layoff waves in the last decade.

The correlation between education level and resistance is not surprising as it is usually easier for higher qualified personnel to find a new job if the introduction of new technologies finally result in headcount reduction; higher-qualified employees are better at accommodating to such changing environments. This statement can also be supported by the fact of negative correlation between unemployment rates and qualification levels (Acemoglu & Pischke, 1999).

London and Diamante describe another important factor in their aforementioned study: personal differences in handling technology changes. Technological-focused expansive employees will enjoy the variety of new ICT enhancements, but are going to be bored during the periods of long-term constant operations. On the other side technological non-expansive professionals will tend to value a non-changing technological environment and can easily be frustrated by the challenges of knowledge-updating activities.

3. Employer ways of handling employee reactions

There are various instruments for a company to help its employees to overcome the difficulties of learning new technologies and to make them interested in doing so. The training and knowledge management efforts described below are the most common areas. (Companies must not forget that the existence of a well-aligned - direct and indirect - incentive system can greatly increase participation and acceptance of those initiatives.)

The most obvious choice of assisting the knowledge update is corporate training. From classroom training and workplace coaching, through (increasingly internet-based) self-studies, to any non-orthodox initiatives, any method can work based on the requirements of the introduced new technology and connected required knowledge. An example of a telecommunication firm applying new techniques in acquiring required skills is the case of British Telecom (BT) in partnership with the Communication Workers' Union (CWU) and the London University's Queen Mary and Westfield College (Stoney, 2002). As a response to the realization of missing skill levels at certain technological areas in its employee base, BT has agreed with the university to start a (mostly Internet-based online) course for BT employees, where they remain in a full-time work schedule during the program and are expected to study 16 hours each week on their own. The course is especially aimed at non-management employees without previous access to higher education and at *"helping members to overcome any resistance to learning they may have built up because of age, low self-esteem or having had an unhappy time at school"*.

Another important tool is the use of knowledge management (KM). In the early stages of learning and adapting to new technologies, users will, in most cases, need support and

assistance. The existence of experience sharing, expert directories, discussion opportunities and codified knowledge repositories will be effective in overcoming periods of frustration and in solving arising problems. An example with results both in easier adaptation of new technologies at various fields (from field technicians to legacy system users) and – as a consequence – measurable financial improvements can be seen at Bouygues Telecom (Peltier & Meinganat, 2002).

The overview of a KM model can be seen in Figure 1, based on the research findings of Hall and Andriani (Hall & Andriani, 2002):

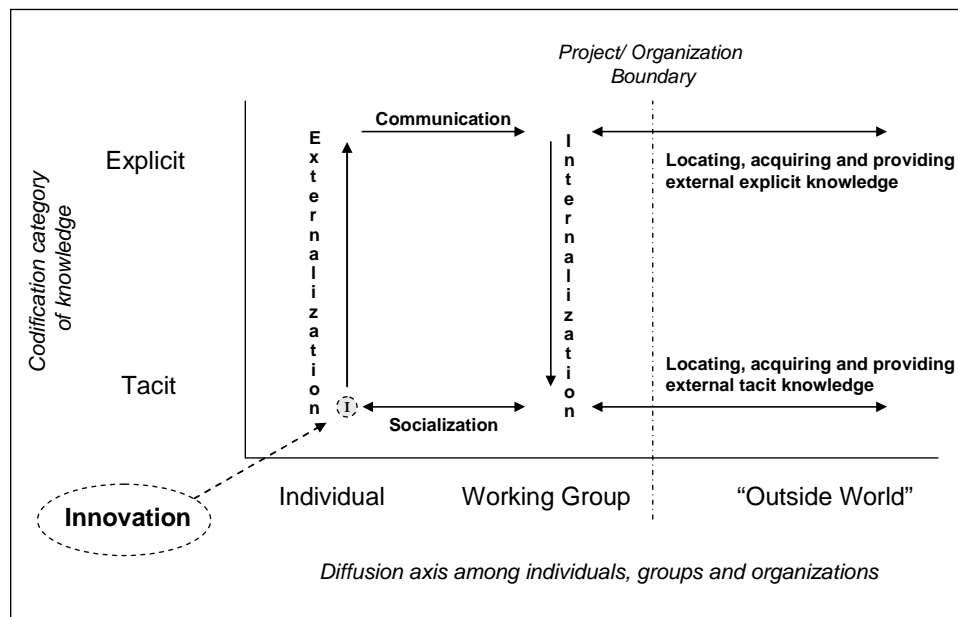


Figure 1: Knowledge management process model
(based on Hall & Andriani, 2002 - Figure 2)

Different companies require highly different balance of focus on the above pictured KM processes of Figure 1, based on corporate characteristics, such as:

- the industry they are active in,
- the business processes they focus on,
- amount of technologies used to produce the products and services,
- amount of patents and licenses that have to be handled,
- the amount of innovation (research and development) produced inside the company,
- fluctuation of employees,
- or the geographical separation of business units, and so on.

As with every initiative that is launched to help the employees, it is always important to make sure the employees understand what can be expected during the process as knowing what's ahead enhances acceptance and success rate.

4. Knowledge Management practices at Hungarian mobile telecom operators

In 2004, I conducted a KM survey among all three Hungarian mobile telecom operators. Participants included both director- and lower-level employees and the form of the survey was a questionnaire using a personal interview to conduct it. Below is a summary of key findings. *(Detailed findings will be published the late spring of 2005, so if you have any questions about the underlying data results, please contact the author for further information.)*

Knowledge management is considered an important business tool to achieve better results (respondents indicated competitiveness and corporate synergies as the main reason for turning to KM); still, the KM initiatives are mainly run in separated threads and are not integrated into a company-wide program. This is mainly because the driving force behind these projects is the particular need of the individual departments and thus the structures required and content greatly vary from case to case. This might also be one of the reasons for not having a Chief Knowledge Officer (a title somewhat hyped in recent years) at any of these companies. There is also a significant amount of connection to global KM initiatives, all three of these companies are owned by Western European operators which may further reduce the need for standalone company-wide KM programs at individual corporate level.

In line with international trends, the main focus of KM has been moving from an IT-centric perspective to a human-resource basis. This is a very important shift, as KM is no longer seen as just another mode for storing and retrieving documents, but as a way to aid people in overcoming work obstacles. Also, building the necessary IT infrastructure is rarely a problem anymore, but moving the employee participation to an active attitude from a passive one is a great challenge. Introducing KM is not without problems; the two major obstacles reported by survey respondents have been first, the lack of knowledge about the advantages of using KM and second, the very high amount of information and knowledge accumulated that makes it hard to use.

Questions about knowledge gaps have been a new element in a Hungarian KM survey. Here companies had to indicate where and how wide gaps exist (and how these gaps are expected to change in the near future) within their different business units. The widest gaps were in sales and marketing, and can be explained by the sales pressure originating from the high competitiveness of the mobile telecom service market. It is also important to note that the indicated future gap size has been narrower for all areas except marketing. This is again a result of the extensive competition and explains why Customer Relationship Management (CRM) programs are at the highest priority of almost every mobile operator in the world.

Going forward

In the area of corporate KM two emerging themes could revolutionize its usage, both trying to reform the model of knowledge categorization. One is concentrating on higher involvement of users, where they can “tag” the items, instead of the author or a “dedicated knowledge worker” (similar to the idea behind the well-know “social bookmark manager” website del.icio.us). The other route is based on text analysis, based on linguistics and psychological characteristics of the documents to acquire further insights and interconnections.

Also the role of the policymakers has to be further defined as it seems they do feel the urge to step into this arena (sometimes to aid the advancements of companies, other times to help the employees save jobs), but their activity raises several competition, authority and consistency questions. Nevertheless, well-prepared, structured and, most importantly, not over-reacting governmental steps might help all stakeholders if rules, positions, intentions, goals and benefits are defined on mutually agreed to grounds. The unions as tradition mediating organizations will also be able to play a helpful role in these initiatives as seen in the aforementioned British Telecom Case.

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