*Global J. of Engng. Educ., Vol.6, No.2*
*Published in Australia*
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# The Society of Danish Engineers – More than a Union

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What do engineers want and what do they expect from their professional associations and bodies? This is an essential question that needs to be reconsidered i light of the new knowledge economy. In reflecting on this question, the Society of Danish Engineers (IDA) has launched a strategy to become more than a union. The IDA seeks to create and host learning environments for engineers and technological knowledge workers. The article elaborates on this strategy and discusses the prospects for enhancing the employability of engineers through enabling contexts and learning communities of engineers. The KNOWING project is also presented, which seeks to identify future opportunities and threats for Danish engineers. Several scenarios were envisaged under this project, including the Vet Scenario, the Coach Scenario, the Farmer Scenario and the Jockey Scenario; these are all elaborated on. One of the prime conclusions from this project was the importance of career planning. Furthermore, the learning environments of engineers are discussed in relation to so-called *Communities of Practice* (CoP), which define the social arena or context wherein persons have experiences, and also gives meaning to their world.

## INTRODUCTION

Due to changes in the economy, the traditional employer-employee relationship has changed. Sharp distinctions are weakened and blurred when increasing numbers of employees become shareholders, self-employed, employed on a contractual basis as consultants or through other non-traditional means. Of course, this is a challenge to the trade unions and, indeed, to the Society of Danish Engineers (IDA), Copenhagen, Denmark, which organises about two thirds of the Danish engineers (approximately 60,000 members).

When workers become knowledge workers, the traditional forms of wage labour are modified and differentiated. Exchanging time for wages becomes obsolete. When production and services are made flexible in time and space due to new Information Communications Technology (ICT), time cannot be used as a measurement for the exchange. Performance, competence and results become the new standards for payment. As a consequence, collective bargaining becomes increasingly irrelevant for the knowledge workers of the future. Trade unions must adjust their services to adapt to their members' changed situation and needs – and so must the IDA.

Employability – the ability to get the next assignment, contract or job – is what matters to knowledge workers. Maintaining, acquiring and constantly developing knowledge and competencies are the means to secure employability. This is why still more trade unions and professional organisations all over Europe focus their efforts and resources on establishing services such as career planning, education, life-long learning, continuing professional development, etc. However, this reorientation and shift in services has not been completed. To a large extent, the European trade unions are at a loss and seek a new identity; they lack the tools required and are in need of models that can transform them into attractive social partners in the new economy.

As a consequence, the IDA has adjusted its policies and strategies in order to focus on employability and competence. The board of the IDA has identified five foci that will guide the work undertaken at the IDA in the future. These five elements are:

1. Recruitment of new members;
2. Competence;
3. Member services;
4. Networks;
5. Policy making.

These five foci stress the ambitions of the IDA to become more than a union. The IDA seeks to create and host learning environments for engineers and technological knowledge workers – where members can turn to in order to gain support, guidance and new knowledge in their efforts to maintain and develop their employability.

For some years now, the IDA has investigated and analysed engineers' opportunities and possibilities for learning and competence development. This research provides the basis of the IDA's strategies. This article describes some of the insights and results from the IDA analyses and delivers a preview of some of the tools and methods that the IDA hopes to develop in order to become more than a union: namely a centre for learning networks.

## A LOOK AT THE FUTURE

We do not know anything for sure – least of all about what the future will bring. Attempts to predict the future have proven futile and, in some cases, disastrous. Prognoses and forecasts of skills requirements and competence needs are flawed when we look at the distant future – say 10 or 15 years from now. In a world as complex and rapidly changing as ours, unpredictability is, more or less, a premise. So how can the IDA ever fulfil its ambition to become a centre where members can find guidance and help to develop their skills and competences to match future job requirements? Similarly, what services (courses, continuing education, etc) should the IDA provide for its members in order to prepare them with new knowledge and competencies?

There are no simple answers to these questions. In this case the best thing to do is to consider *possible* and alternative developments and futures – not in order to find the likely one, but in order to prepare for eventualities and to focus the IDA's strategy to cope with the future, how ever it may turn out.

## THE KNOWING PROJECT

In collaboration with Roskilde University, Roskilde, Denmark, and the Danish Technological Institute, Taastrup, Denmark, the IDA has developed the KNOWING project. This project sets out to draw a map of the future regarding the opportunities and threats for Danish engineers so that they can maintain and develop their employability [1]. It should be noted that the scenarios are much more detailed than this limited space allows.

The analysis is based on survey material and qualitative research on Danish engineers competencies and attitudes towards work and learning. The analysis also includes research on employers' preferences and recruitment strategies.

The objective of the analysis is to compare possible futures with present day competencies and skills among various groups and segments of engineers. The KNOWING project describes four possible scenarios. They differ from one another according to their need for specialised versus flexible engineers and according to the company's need for innovative versus more routine engineering competencies. For ease of reference they are labelled accordingly (clockwise in Figure 1): The Vet Scenario, the Coach Scenario, the Farmer Scenario and the Jockey Scenario. Using the characteristics from these professions, it is hoped that some of the features of possible future developments, which especially appeal to some engineering profiles, can be pinpointed.

### The Vet Scenario

A characteristic of the Vet Scenario is that companies and engineers are engaged in research, development and innovation. The engineers are the specialists who provide R&D, while the companies are highly dependent on new specialised knowledge. The companies will have to grow bigger and engage in mergers in order to finance expensive investments in R&D. In particular, the larger universities and engineering colleges will prevail.

Students will attend those universities that have a specific research profile, such as in telecommunication technology or biotechnology, whereas the smaller engineering colleges without a high profile speciality will be abandoned by students. Cooperation between industry and academia will increase and still more research, and even teaching activities, will be co-sponsored. Phd scholarships will equally be co-sponsored. Danish companies and universities will opt for high-end solutions and high-tech environments. The skills and competencies needed in this scenario require deep specialisation and innovative capacities.

### The Coach Scenario

In the Coach Scenario, companies and engineers are mostly engaged in developing creative solutions. Danish companies will mainly focus on providing service solutions and managing technical knowledge and know-how. Engineers in the third world, where salaries are lower than in Denmark, perform the very specialised technical work. Danish companies and engineers cannot compete with this, but they do have

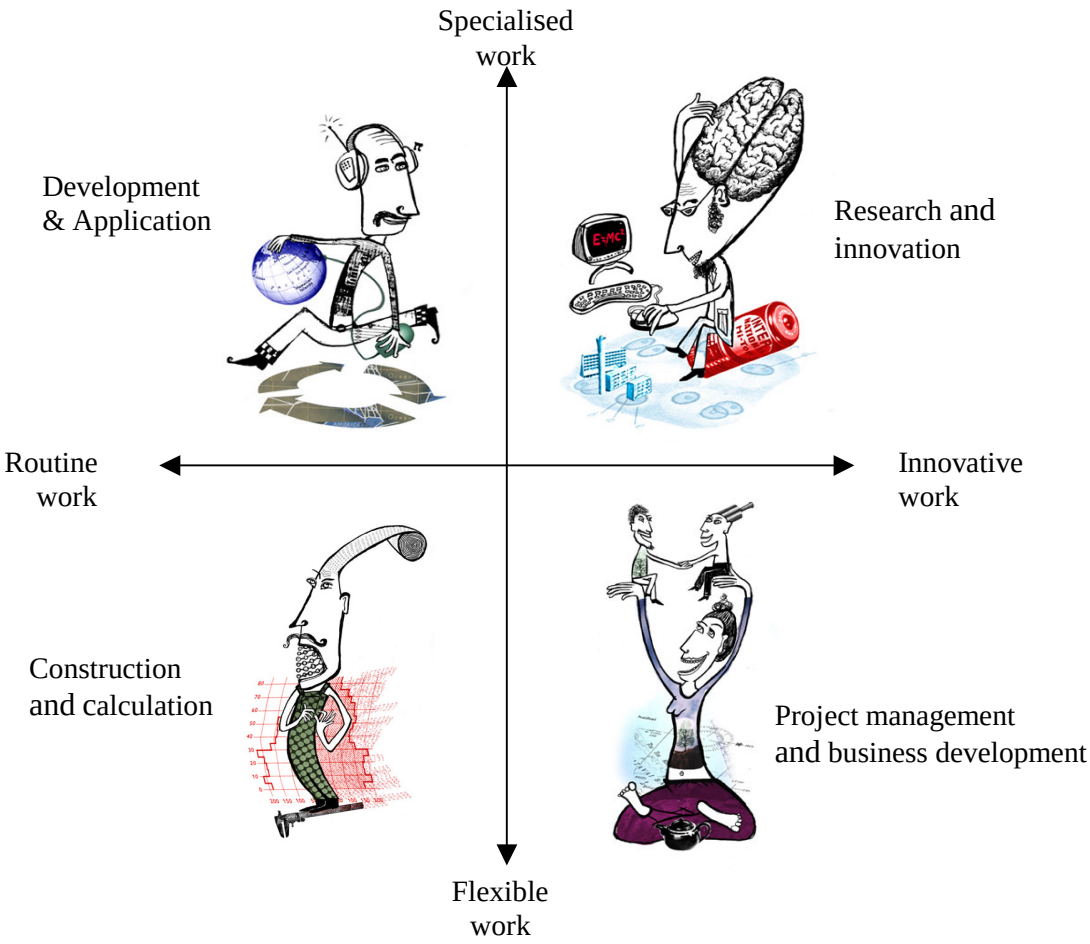


Figure 1: KNOWING scenarios identifying potential opportunities and threats for Danish engineers.

other forces: they can communicate, manage work processes and knowledge flows.

Engineers will become technological knowledge workers and they will have to expand their expertise to other disciplines in order to cope with the complexity that meets them, not only in the technical field of their work, but also in relation to work processes, customer relations, etc. This will result in the tendency of universities and engineering colleges to integrate technological subjects and disciplines with the humanities, business, law, etc.

## The Farmer Scenario

In the Farmer Scenario, Danish companies will remain relatively small; they will not specialise in high-end technological solutions but instead opt for producing low-tech products with high quality. The Danish companies are typically sub-contractors and therefore will have to be flexible in order to adjust to changing demands. These companies will look for engineers with general technical skills in construction and calculation.

Engineering colleges will engage in a closer dialogue with local companies in order to train and educate engineers in close proximity to the specific and present needs of companies. Continuing theoretical education will, to a large extent, be replaced with in-house practical training and engineering colleges will have to act as consultants when firms are about to adjust or change their production. Older engineers with (life) experience and a great deal of practical know-how will become more sought after.

## The Jockey Scenario

In the Jockey Scenario, Danish companies aim at manufacturing highly specialised solutions and products. However, there are few elements of innovation or research involved in this strategy and it is extremely expensive to innovate and finance long-term product research. Instead, Danish companies will specialise in smart solutions and product development.

This strategy calls for highly skilled and knowledgeable engineers. They must be able to pick up and adopt new knowledge at a rapid pace. Given this, universities and engineering colleges must continuously provide former students with courses and training that will bring them up-to-date in their specialised field. Danish universities will be in tough competition with foreign universities in the global market of continuing

education and courses. Even though this scenario calls for highly specialised technical skills and competencies, it must not be forgetten that the engineer's work is organised in a fairly reutilised and restricted way in this scenario.

## DISCUSSION

Many of the trends described in these four scenarios are already present today. However, these scenarios are taken to an extreme in order to highlight the possibilities, opportunities and threats that a future development might bring. To some extent, it is up to the engineers themselves to mark and influence the future, yet the extremes of the scenarios also give engineers the opportunity to reflect upon their own situation in the light of possible futures.

In the research of the KNOWING project it was possible to identify and demarcate groups of engineers according to their competence profiles and general attitude towards work and continuing education. In comparing the characteristics of these groups with the characteristics of the four scenarios, it is possible to make qualified estimates of the success or failure of the ability of these groups to match future competence requirements.

Some groups turned out to be winners in some scenarios, but losers in others, depending on their competence profiles and attitudes towards work and continuing education. As it is not presently known which scenario will prevail, it may seem to be of no use to make a match. However, it turned out that the characteristics of some of the groups were mismatched to *all* of the scenarios. This gives a very strong indication that these groups tend to become marginalised. A characteristic feature of engineers in these groups was that they gave no considerations to their career path; they had not made any decisions whether to specialise or to become more flexible, whether to stick to their field of engineering or to widen their expertise – they just drifted along.

Some of the main conclusions of the KNOWING project emphasises the importance of career planning. It is crucial to constantly monitor and reflect on career opportunities, goals, values, etc, in order to be sensitive to changes and new trends in engineering and the labour market. Awareness of career opportunities and threats seems to be a precondition to enhance employability. In this respect, career guidance and counselling are important tools. However, career guidance and counselling will not make it alone. A prerequisite for career development is the accessibility of learning opportunities; without enabling contexts, formal or informal, there are no chances for learning and development.

## IN SEARCH OF LEARNING

It is very easy to equate learning with formal education or structured teaching and training. Traditionally, learning has been thought of as a process of the transmission of explicit, codified knowledge and as a process of the adoption of physical skills. Following this line of thought learning has been equated with formal and structured activities such as attending courses, seminars, Masters programmes, etc. Training in engineering has been seen as a purely intellectual and cognitive endeavour.

However, research on work and learning among professionals has shown that there is much more to learning than the cognitive dimension – even for knowledge workers [2-5]. Knowing and coming to know has both a tacit and a social dimension [6][7]. It is physical and social beings, people, who learn and they learn in special contexts and situations. In this view, learning is not restricted to the classrooms or seminar rooms. Learning is something that takes place all of the time – when we are engaged in dialogues with other people or when we are trying to solve a problem in a work environments. We seem to know much more than we can tell and we seem to learn in much more complex patterns than presumed by traditional teaching methods.

This insight is reflected in the IDA's efforts to enhance members' employability. When it is realised that learning encompasses more than just teaching, new avenues of enabling learning opportunities emerge. Social theories of learning suggest that learning must be seen as a phenomenon that is a constituent part of engaging in a practice [7-9].

### Communities of Practice

In social activities, such as at work, people take part in various practices and activities. They belong to Communities of Practice (CoP), which define the social arena or context where individuals have experiences; they give meaning to a person's world. CoPs can, for example, emerge among colleagues or peers engaged in a common activity. It is characteristic for CoPs that members share many ideas, values, goals and visions about their endeavour and that they interact and negotiate their views in order to form a consensus. Members of a CoP also often share a common repertoire of experiences and histories. In the social practice of a CoP a common attitude and perspective on things are formed and reformed in accordance with the members' experiences.

It is through participation in CoPs that learning takes place: individuals can interact and give meaning to what

should be counted as competent or incompetent action. A CoP prescribes standards and becomes a point of reference for competence. In order to be accepted as a legitimate participant in a CoP, a person needs to have the opportunity to interact with peers and thereby construct a learning trajectory.

This broader perspective on learning makes it possible to understand learning as a process that is not confined to formal teaching environments. A great deal of learning takes place in the workplace when engineers interact and solve problems. It is of the utmost importance that this kind of learning be recognised and appreciated as it plays a crucial role in engineers' efforts to maintain and enhance their employability.

## ACTIVITIES OF THE IDA

To continue and be evaluated as competent, an engineer must have access to not just the *know that* of engineering, but also to the *know-how*, *know where* and *know why* of engineering. An engineer must have access to CoPs of professional peers in order to discuss and learn. To enhance employability and learning opportunities, we must look to the workplace to establish enabling contexts. One of the IDA's goals is to establish networks among engineers at local workplaces, across companies, between industry and academia, etc, in order to create new enabling contexts for learning.

A significant part of the many and varied activities of the IDA concerns science and technology issues. These activities include a broad range of technical lectures, company visits, courses and large conferences and symposia, at both the national and international levels. More importantly, the IDA facilitates a network of science and technology societies and regional groups. Every year, these science and technology societies and groups host approximately 850 events, which attract approximately 32,000 participants across Denmark.

These activities offer members the opportunity to keep abreast of technological advances, as well as relevant trends in society. The initiatives are structured according to areas of interest, in relation to technology or to society in general. These specialist areas are handled both by nationwide science and technology societies and the regional groups that closely follow developments within their field and organise events and meetings on appropriate occasions to discuss technology issues and learn from one another. The science and technology societies and groups comprise an ideal network structure that can enable the emergence of new CoPs and arenas for learning.

It is not the aim of the IDA to design or plan learning. Likewise, the IDA cannot provide or transmit new technological knowledge to its 60,000 members. The IDA's members are very often experts in their own field and very specialised. In fact, it would be redundant and futile to seek new technological knowledge outside this pool of resources. Instead, the IDA's ambition is to establish contexts where the members can share, develop and create new knowledge. This implies that it will be very difficult to predict exactly what should be the output of the learning process and what kind of knowledge should be shared or developed.

The IDA is not a knowledge management centre where the knowledge flows are designed according to specific and fixed rationales. The science and technology societies and groups in the IDA are better compared with a knowledge eco-system. Knowledge is distributed and shared according to the members' own interests, ambitions and aspirations. The role of the IDA is to sustain and cultivate the knowledge eco-system among the members. Knowledge production and learning is governed by its own rhythms and logic; it cannot be managed or forced, but needs to be stimulated, nurtured and cultivated.

## SUMMARY

The focus of the IDA's activities are centred on improving the employability of its members. Career development, learning and technological knowledge are vital ingredients for success. The IDA already provides career courses for Danish engineers and, as stated before, the activities in the science and technology societies and groups generates learning opportunities for participants. These initiatives will be further developed in the future.

The IDA has launched a strategy to become a *Cyber Union* (a term originating from Shostak [10]). The ICT is an important and efficient tool for the provision of services to technology knowledge workers. This strategy sets out to supplement the IDA's physical services with virtual ones. It should be possible for the IDA's 60,000 members to access the IDA on the Internet in order to gain information, guidance, etc.

The focus on competencies, learning and technological knowledge sharing is an important part of this strategy. The intention is to create a competence Web site – an ID*e*A – where members can go to describe their competencies, their need for new competencies, develop career plans, get in contact with peers, form virtual communities of practice, etc. ID*e*A will come to include the following facilities: career tools,

community tools, e-learning tools and a technology site for virtual conferences, discussions and debates.

Although the IDA is not a university and does not provide teaching or formal education, it provides an infrastructure of networks for Danish engineers who aspire to learn and develop new knowledge. The Society of Danish Engineers is indeed much more than a union!

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## BIOGRAPHY

Born in 1962, Anders Buch works as a senior consultant in the Society of Danish Engineers (IDA). He is presently involved in the organisational development of the IDA as a professional body. He holds an MA in philosophy from Copenhagen University, Copenhagen, Denmark, and a PhD in education from Roskilde University, Roskilde, Denmark. He has been a visiting scholar at the University of California, Berkeley, USA, and he lectures at the Department of Educational Research, Roskilde University.