

Looking Back and to the Future—Leadership from a Swedish Perspective

When approached by Prof. Nehorai about contributing to the “Leadership Reflections” column, I was first hesitant, since I doubted whether I really had something of value to add since so many experienced research leaders have already shared their experience in this column. After reading several earlier contributions with great interest, I realized that it might be of interest to share some of my experiences from Swedish Academia in general and Uppsala University in particular. Many current problems and challenges are certainly global, but the situation in Sweden differs in some respects from most other countries. In this contribution, I will therefore briefly describe the current situation and trends related to leadership from a Swedish perspective and from my personal horizon.

ABOUT UPPSALA UNIVERSITY AND SWEDISH ACADEMIA

Founded in 1477, Uppsala University is the oldest university in the Scandinavian countries. Initially, it was entirely devoted to theology, but over the centuries new areas have been added. Today, it is the broadest university in Sweden with faculties in Theology, Law, Arts, Languages, Social Sciences, Education and Sciences, Medicine, Pharmacy, and Science and Technology. Science and Technology is the largest faculty, with a budget close 40% of the university total. The university has a total of 40,000 undergraduate students and another 2,500 graduate students with a strong focus on research. There are 3,000 established international research collaborations and an active student exchange program with over 400

universities around the world.

In Sweden, the universities are under the control of the government with only a few exceptions. The students have no tuition fees for their education. The money necessary to support the services offered by universities comes directly from the government. During the last 15 years, the financial support per student from the government has decreased drastically. A large part of the educational budget has instead been allocated for the creation of new universities and colleges throughout Sweden. Due to this redirection, the established universities have seen drainage in their resources. It is now important that academia convince the government that funding of education, especially the universities, must increase in the immediate future. A positive effect of the increased number of academic institutions is that a larger proportion of the population gets a university degree. This is, of course, beneficial for the individual as well as for the country.

In Sweden, the Ph.D. program is handled under a special budget. All Ph.D. students have a four- to five-year employment at the University, which can make their Ph.D. work both enjoyable and rewarding. These studies are usually combined with teaching activities at the department. To cover the cost for Ph.D. students and faculty, the government funding must be combined with external money. Our department has been very fortunate in this respect. This is largely due to our good fortune of having several highly ranked professors, which has enabled us to obtain good outside funding, e.g., the National Science Foundation. Our department received 29% of the national total in computer science for 2005. We are also quite active

in European Union projects and have established several fruitful collaborations with industry.

Another important problem, not specific to Sweden, is that science and technology have lost their appeal to the new

EDITOR'S INTRODUCTION

The author of this article has been active in research for more than three decades. However, it is only in the last ten years that his role as a leader has been developed. After a few years as head of the Systems and Control Division, Håkan Lanshammar is now head of the Department of Information Technology at Uppsala University, Sweden, which is one of the leading groups in Europe in this area. During his six years as head and chairman of the Board, the number of employees has almost doubled, and today there are 200 employees and 1,000 full-time students at this department. In his article, Lanshammar describes some of the characteristics of Swedish universities. For instance, they are not allowed to charge tuition fees; instead, most funding for the educational programs comes directly from the government. Lanshammar's first aim as the department head is to create and maintain a positive working environment and atmosphere, including psychosocial factors and high-quality services for students and staff. When researchers go to work with a smile on their faces, creativity increases and productivity goes up. I invite you to read this article, which gives an interesting exposure to the education system and leadership in Sweden.

—Arye Nehorai
Associate Editor,
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generation of students. This has resulted in an unbalanced situation in which there are more places to earn a university degree in science and technology, but fewer interested in a degree in this field. Therefore, one important task is to try to understand this problem and to come up with methods to change this. It is particularly frustrating to see that we are not attracting females, which means that we are losing almost half of the potential student population.

From a leadership point of view, the situation in Swedish academia has changed dramatically over the last few decades. The number of departments has decreased at Uppsala University from almost 200 to about 60, and at the same time a new role for the departments has developed. A typical department in a Swedish university today is similar to a medium-sized company. The head (or director) of the department has full responsibility concerning nearly all aspects of the activities within the department, including education, research, personnel, budgets, and interaction with nonacademia.

PERSONAL EXPERIENCES

When I was a freshman at Uppsala in the 1970s, the study programs at the faculty of Science and Technology were dominated by the natural sciences; over the years, engineering programs has taken a larger share and now dominate the scene.

I came to Uppsala from Stockholm University to study engineering physics, and my dream at that time was to become a researcher in quantum physics. After taking a course in automatic control, I changed my mind and enrolled in Uppsala's Ph.D. program instead. It was then that I got involved in research of human movement, and this has been my main research area ever since. The study of human movement involves several challenges in a variety of disciplines, from orthopedics and neurology to automatic control and signal processing. I have found it very rewarding to be able to work together with researchers from widely different areas. Combining this with teaching and the supervision of graduate

students is time consuming but well worth the effort.

ELEMENTS OF A POSITIVE WORKING ENVIRONMENT

I became the head of the Department of Information Technology six years ago. It is now the second largest department at Uppsala University, and the number of employees has almost doubled while I have been in this position. It is really exciting to work in a growing organization, and I now feel that my main task is to maintain and strengthen the good working environment that we have all helped to create. If people are happy and look forward with enthusiasm to new challenges that await them upon arrival at their workplaces each day, then most problems can be handled in a reasonable manner.

In my opinion, some key elements in creating a positive atmosphere include:

- *Use an open door philosophy.*

Always be prepared to listen to your coworkers. If there is a problem, professional or private, and no one is prepared to spend time in trying to understand it, then the problem is likely to grow.

- *Keep the organization as flat as possible.*

It may be necessary to have a hierarchical structure in a large organization, and to have a clear definition of where different types of decisions are made. However, Swedish universities are by tradition collegial, and important strategic decisions are usually made in consensus. Sometimes this can be quite problematic, since there is a tendency that difficult decisions are not made at all or delayed too long. On the other hand, when a collegial decision is made, then it usually has such a strong support that it is possible to go ahead with a common focus and implement the decision quickly.

- *Be flexible and adjust the leadership according to the circumstances.*

Naturally, it is sometimes necessary to be firm in a decision. Teachers must adjust to schedules concerning courses, students must be given high priority, lectures and examinations

must be given according to schedule, and there are many rules concerning teaching that must be followed. On the other hand, I do not think that it is a good idea to try to influence the research direction of a group. It is only the experts in a field that are capable of deciding where research winds are blowing. To have a creative atmosphere, I think that it is necessary to allow many flowers to bloom. In the end, what really matters is scientific excellence, and this can only be achieved when researchers define the research area themselves.

- *Be proud and show it clearly internally and externally.*

Here, I believe we can learn a lot from the United States. In Sweden, there is a saying that no tree should be allowed to grow higher than all other trees. In the United States, the opposite seems to be true. By being proud of your department and its contributions, you help everyone in it grow even further! As a control engineer, it is natural to look for and strengthen positive feedback loops that can promote growth! On the other hand, you must of course be sincere concerning your emotions. People quickly see through you if you offering praise without really meaning it.

- *Do not hesitate to give negative feedback.*

Problems are bound to appear, and many of them will not disappear automatically. When criticizing someone, it is crucial that you focus on specific behavior and not on the individual in general terms. To obtain a positive outcome from the criticism, it is important to also give positive feedback when positive results are achieved. It is said that an 80%/20% mix of positive and negative feedback is actually perceived as 50%/50% by the person receiving the feedback. Here, I suspect that many Swedish people are not acting properly: Positive things are often overlooked and instead problems stay in focus!

- *High-quality administration and technical support is an important component in a creative*

environment. In this area our philosophy has been to recruit highly qualified personnel and to create an organization where there are back-up staff for all critical functions. The organization is also clearly defined so everyone knows who is responsible for different tasks. The support staff is divided into working groups, which prevents isolation, and they work with a clear focus on supporting the main activities, research and education.

CURRENT AND FUTURE CHALLENGES

The world is now facing several challenges. As an example, climate changes, believed to be caused by man, are a major threat to many countries. From Sweden's point of view, we seem to be moving toward a climate closer to the present Mediterranean, which could be good for us, but in a global perspective many severe problems can be expected. In my opinion, it is sad that the young generation in the industrialized world is now turning away from mathematics and engineering. I believe that many young people blame a lot of today's problems on recent technical developments and that they do not wish to be associated with these developments. On the contrary, it is my strong conviction that to solve these problems we need more knowledge, not less.

Therefore, we should all take on the responsibility of trying to help and guide the new generation of students. We cannot and should not tell them what their goals should be and what kind of society they should create. However, I think that we, those working in academia, have a duty to work against superstition and ignorance. We must do what we can to make everyone realize that, whatever your goals may be, you are more likely to move in the desired direction if you are equipped with the best possible tools and the knowledge of how to use them. Here, mathematics and engineering science are really a gold mine. In themselves, they are neither good nor bad; but, if one learns how to use these tools, they offer the possibility of understanding how our world works. If you master them, you

can make a difference.

AUTHOR

Håkan Lanshammar is head of the Department of Information Technology at Uppsala University, Sweden, since 2000, and was previously head of the Systems and Control Group at the same university. He received his B.Sc. degree in mathematics and physics from Stockholm University (1970), M.Sc. degree in engineering physics (1972), B.Sc. degree in economics (1976), and Ph.D. in automatic control (1977) from Uppsala University. He is a member of the International and the European Society of Biomechanics and has served as editorial consultant for the *Journal of Biomechanics*. He has authored and coauthored 100 publications. His research is focused on methods for human motion analysis, and in this area he has organized and chaired an international conference and special sessions at various congresses.

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