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CHALMERS UNIVERSITY OF TECHNOLOGY - CHALLENGES FOR A NEW CENTURY

Assignment for the Course in Institutional Management and Change in Higher Education 1998/99

Hans Näslund, Office of Evaluation, Lund University
Box 117, SE-221 00 Lund, Sweden
E-mail: Hans.Naslund@evaluat.lu.se

The following paper is intended as an input for the strategic planning at Chalmers University of Technology for the planning period 2000-2005. The presumption is that the author is an external expert invited to give an opinion on strategic issues; the paper is supposed to be his report to the Central Management Group at the university.

After an overview of changes in the educational environment that will affect the conditions for institutional planning at Chalmers, the report gives a critical review of strengths and weaknesses in the university's organisation, governance, and quality assurance arrangements. In conclusion, it contains a few recommendations on some vital issues for the future.

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1 Winds of change in higher education

The conditions for higher education, nationally and globally, are changing rapidly, and institutions have to be prepared to adapt to those changes. Chalmers Technical University (Chalmers Tekniska Högskola, CTH) has a unique position in Swedish higher education, and a unique potential for change. Its status as an independent institution, with more freedom than Swedish universities generally have, should make innovations possible that could not be realised at other institutions. By commissioning the present review, Chalmers has displayed a readiness for change and innovation.

In the following paragraphs, some of the most prominent changes in the educational environment at the turn of the century are summarised, and the implications for CTH are outlined.

1.1 Organisational change

First of all, the change of status for Chalmers in 1994 has involved changes in the organisational structure of the institution, and also - which is even more important - in the institutional ethos of the university. The exemption from the rules and regulations governing other state universities gives a feeling of freedom, and this has opened the way for an entrepreneurial spirit which looks very auspicious for the future.

In practice, however, as Burton Clark has pointed out in his presentation of Chalmers as an "entrepreneurial university" (Clark 1998), some of the general rules and traditions governing administration and staff management are still in force at Chalmers.

1.2 Deregulation

Among external factors influencing higher education institutions, one very important is the tendency towards decentralisation on the part of the government and increased autonomy for institutions. At the same time as the ex-ante regulations are reduced, the government requires that the institutions should be more accountable and demands reliable quality assurance measures. Government steering is still manifest - but takes the form of ex-post control of output, whereas the traditional form of steering was mainly input-related.

This is not a unique Swedish phenomenon; it might even be maintained that this trend has been somewhat weaker in Sweden than elsewhere. Chalmers' new organisation is a manifestation of this tendency. However, when the liberal-conservative government of the period 1991--1994 was replaced by the social democrats, there was a partial return to the old-fashioned input planning philosophy, which has meant less freedom for institutions to decide about enrolment and admission requirements. Nevertheless, the change of government has not entailed any changes of CTH's organisational status, and it is unlikely that it will be changed in the future.

1.3 Competition

Chalmers and other Swedish universities will soon find themselves in an increasingly competitive situation. Until now, Swedish universities and colleges have not had to compete for students; the number of applicants in most sectors has been larger than the available student places. This will rapidly change in a near future as the university age cohorts become smaller at the same time as the admission capacity increases, particularly at the new universities. It would seem apparent that Chalmers, with its independent status, would be in a better position in this competition than many other universities. However, the freedom for institutions to decide their own admission requirements was again centralised in 1995; and the general admission rules are valid also for Chalmers.

With increasing student mobility, institutions like Chalmers will also have to face competition on the international level. It will become increasingly necessary for higher education institutions to assert themselves in comparison with first-class universities elsewhere in the world. The competition is sharpened by the growth of web-based courses on the Internet.

The competition for resources is already apparent. With increasing demand for higher education and the ensuing widening of access, government grants to universities tend to become scarce. In the period 1995--1999, state funding per student has been reduced by about 15% in Sweden. Also the basic research funding has been cut down the last few years, and universities has become increasingly dependent on external funding, from research councils, from the strategic research foundations, from international sources and from industry.

1.4 Open and distance learning

Distance learning - or distributed learning, as it is sometimes called - is becoming a more and prominent feature in universities, in Sweden as elsewhere in the world. Unlike several other European countries, Sweden has never had a designated distance teaching university. Distance learning on university level has been the task of the regular universities.

The advent of the Internet, and particularly the Web, has added some very powerful tools for distance learning. “Virtual universities” are emerging in several countries, and even regular on-campus students have the possibility to take courses at distant universities on the Web. Swedish universities have been relatively slow in engaging in web-based courses, and Chalmers is no exception in this respect. In fact, Chalmers seems to be slower than many other Swedish institutions. The University of Gothenburg has created the Gothenburg Virtual University, and is a founding member of the “Nordic Net College”, in partnership with the NKI Group in Norway and the College of Graphic Arts in Copenhagen. Chalmers does not seem to have started any distance learning or web-based courses at all.

On the other hand, Chalmers is very active when it comes to professional development, particularly for industry. Contacts with industry are of course of vital interest for a technical university like Chalmers. Several units within the university are created expressly for this purpose: the Centre for Professional Development, Chalmers Advanced Management Programmes (CHAMPS) and Chalmers Industrial Technology (CIT). The Chalmers professional development programmes have a yearly turnover of 56 million SEK (6.4 million EUR), and during 1997 over 3,000 people took part in the programmes.

The role of universities in professional development for industry and civil service is becoming more and more pronounced. This development is also strongly supported by government. However, unlike Chalmers, many institutions are beginning to realise that distributed learning based on information technology is the most efficient way of fulfilling this task.

1.5 Teaching and research in non-traditional areas

New areas of learning are beginning to be seen as interesting for prospective employers: they are asking for a broader scope of competence, including also fields outside the traditional technology subjects. This is clearly an exacting challenge for a highly vocationally-oriented teaching institution like Chalmers.

Chalmers is a good example of an institution which has managed to adapt to such demands: there are now undergraduate programmes in areas like Biotechnology and Environmental Science; Chalmers has created an Entrepreneurial School, and opened an international Master of Science programme. Social and cultural aspects on technology are introduced in the curriculum through the Thematic Days which since the early 1980s are arranged every year under the heading Man, Technology and Society (MTS-days), and which are compulsory for all students in the technology programmes. The responsibility for these elements of the curriculum lies with the Department for Technology and Society which was created in the 1980s.

However, in spite of these innovative steps, the possibilities to *include optional courses in non-technological subjects* in an engineering degree at Chalmers are still limited. The national audit team which reviewed the quality assurance system at Chalmers last year remarked in their report that they “were unable to trace any greater interest for these matters neither in the preparatory material nor in the discussions during the site visit” (Högskoleverket 1998, p 39).

New areas of research often develop outside established academic disciplines. Effective support to such developments requires flexible modes of organisation and funding, which is a challenge for any established university. The academic establishment is usually rather conservative is this respect: the “academic tribes” tend to defend their “territories”

(Becher 1989). The “pigeonholing” described by Henry Mintzberg as a characteristic of professional bureaucracies (Mintzberg 1983) is an effective hindrance to structural innovations, and has to be overcome by an institution which does not want to stagnate.

Chalmers is an institution committed to innovation and development. the university has also been very successful in creating links with the outside world, particularly industry. Chalmers seems to have been able to overcome the pigeon hole syndrome, judging from their ability to create research centres in new areas. An example is their School of Environmental Sciences, with research programmes in a number of interdisciplinary areas like Aquatic Environmental Science, Ecotoxicology, Economic and Social Science Environmental Research, Biologic Diversity, Air Pollution and Radiation, etc.

2 Strengths and weaknesses at Chalmers

After this general outline of changes that will affect planning at Chalmers the next few years, I will take a look at three critical areas of institutional management - organisation, governance and quality assurance - and try to discern the strengths as well and the weaknesses in each of these areas.

2.1 Organisation

Entering its new organisational status, the challenge for Chalmers has been to combine the new corporate structure with the academic organisation. Legally, Chalmers is now a stock company; the Rector is CEO of the company, and it has to follow the rules of the Swedish Companies Act. The endowment from the state which constitutes the financial basis of the new organisation has the form of a foundation, which in turn owns all the shares of the company. The idea of making a university into a stock company may seem a little odd, but Swedish politicians and administrators were not able to find another solution.[1]

The strength of this kind of organisation - and the reason why Chalmers opted for it - is that it means that the general rules and regulations which govern other institutions of higher education are not valid for Chalmers. As Burton Clark has reported (Clark 1998), there were three main reasons why Chalmers wanted to make this transition: the wished to have
- “simultaneous right of disposition over all resources”
- “a more flexible organisation and less restrictive handling of finances”
- “greater flexibility when it comes to recruiting and employing staff”.

In these respects the organisational change can be said to have realised the objects desired; Chalmers no longer has to feel constrained by the rules of Swedish civil service. However, the main benefit of the new status is probably psychological: as already pointed out, the management spirit of Chalmers (which was there even before) has now become much stronger and is felt to have more leeway in planning and management.

On the other hand, the internal organisational structure at Chalmers is still to a great extent the same as at other universities. The central management seems to be somewhat stronger than in a traditional university - but that is also true for other technical universities or engineering schools.

[1] A couple of years later, a committee appointed by the Ministry of Education proposed a revised legal status for all Swedish universities, transforming them from government agencies into self-governed bodies (similar to the status of British universities). This suggestion was, however, turned down by the then social democrat minister.

The present organisation is shown in Figure 1.

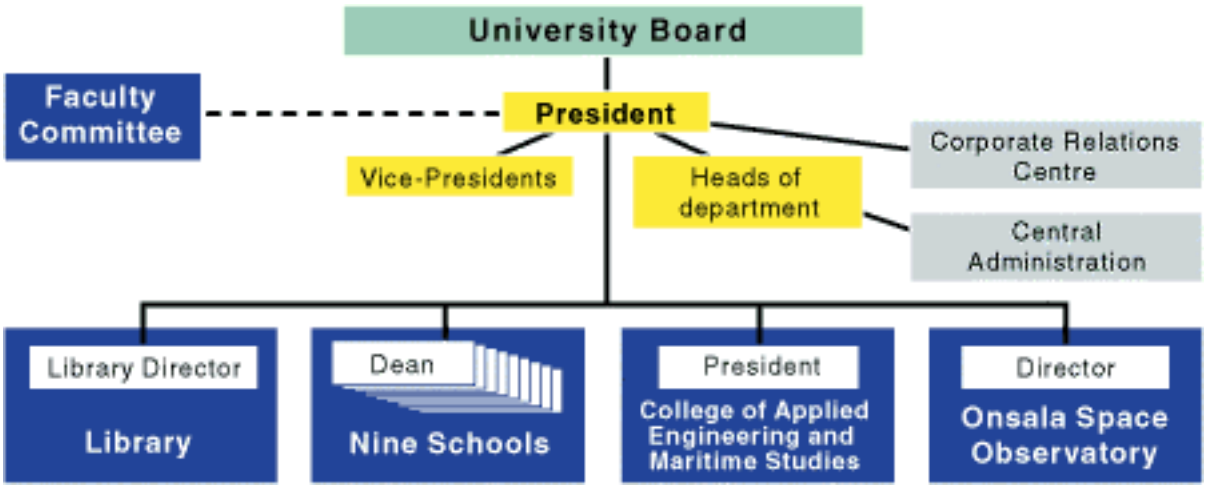

Figure 1. The organisation of Chalmers Technical University (from Chalmers' Annual Report 1998)

One feature of Chalmers' organisation that would be worthy of imitation at other universities is the Faculty Committee (or Faculty Council as the literal translation would be).

Swedish universities generally lack an academic body at the central management level; the governing board, with a majority of lay members, has to decide on academic as well as administrative and financial matters. Chalmers' faculty committee seems to serve as a equivalent to the senate at American and British universities, where matters that require an academic judgement can be handled. However, unlike its counterparts in other countries, the faculty committee does not have any formal decision-making power, and serves as an exclusively consultative body.

2.2 Governance

At first sight, Chalmers seems to have adopted a more corporate style of governance than traditional universities. There is a board with an external chairman, the executive committees of the schools are also chaired by lay members, and there is a powerful central management group around the Rector (President). Unlike the traditional pattern, deans of the various schools are appointed by the president. Decision-making also seems to have adopted a more corporate model, with the President's management group at the centre. At the same time. However, traditional collegial forms of decision-making still persist - which is a necessity in an academic setting.

But such trends are not unique for Chalmers; several other Swedish universities are modifying their management organisation on the same lines. These are common tendencies, also internationally.

The national audit team which reviewed Chalmers' quality assurance system made the following observation (translated from Swedish):

> *"During the last years, Chalmers' management admirably and consequently has been developing institutional leadership, particularly concerning the role of vice-presidents and especially the role of the deans. In regular meetings, conferences and joint study trips the leadership role has been systematically developed, and a*

concord has been created in the group of president, vice-presidents, deans and administrative chiefs." (Högskoleverket 1998, p. 28)

The audit team also noticed that even if deans are formally appointed by the president, the traditional collegial way of selection still seems to be prevailing when candidates are nominated.

2.3 Quality assurance

In its information material intended for an external audience, Chalmers often emphasises its quality ambitions. As was pointed out in the 1997 Annual Report, the overall philosophy of Chalmers has been that quality issues are something that should permeate all aspects of the university's performance.

The quality programme at Chalmers was evaluated in 1998 (Högskoleverket 1998). In their report, the audit team cites a statement during the site visit saying that "quality work is integrated in the day-to-day activities but it is not documented". Chalmers' self-evaluation report was also not, as the team had expected, a description and analysis of flaws and weaknesses but more of a general report on goals and activities. The overall judgement in the audit report is that "Chalmers does not yet have a continuous and systematic quality work focused in processes and process-analysis covering the whole university".

But at the same time the audit team also points out that there are a number of good quality initiatives at Chalmers, not least the national evaluations of the various engineering programmes, where Chalmers has been the initiator of several. Systematic quality assurance work of the kind that the audit aimed at could also be found in some areas, but not generally and comprehensively.

In the 1998 annual report Chalmers cites the overall judgement of the audit team and welcomes their recommendations. Beside the tangible proposals emanating from the review, it has been very valuable through the intensive discussion that it has brought about within Chalmers during the last year. The report is thus, concludes the Chalmers annual report, a very valuable starting-point for further deliberations. It is not clear, however, whether Chalmers is going to heed the recommendation "to develop and realise a comprehensive programme for quality development".

Ths lack of a comprehensive quality programme, and means for follow-up of the programme, is doubtless a weakness in an institution where quality is so much emphasised. On the other hand it must be pointed out that the university's endeavour to integrate quality issues in all aspects of its activities is also a strength. There is no reason to doubt the general quality of teaching and research at Chalmers - in fact Chalmers is is a national and international prestige institution, and both staff and students seem to be convinced about the high quality - but the lack of a coherent and systematic approach to quality assurance at the central management level is something that ought to be amended.

3 Recommendations

This paper concludes with some recommendations for the future that could be contemplated by the management of Chalmers. It should be stressed that they are conceived from the perspective of an outsider; the actual decision about which steps to take in what direction has to be made by the institutions itself, and the actions taken must have the support of the organisation.

This said, I take the risk of presenting the following suggestions.

3.1 Admissions

With its new status as a non-government institution, Chalmers has achieved a considerable degree of autonomy with regard to finance, staff recruitment and salary policy. Nevertheless, in several areas the university still is restricted by the same regulations as other Swedish institutions.

One such area is admission of students. The 1993 higher education reform in Sweden meant that the admission decisions were decentralised to the institutions (albeit centrally administered), and also that each single institutions could decide about its own admission requirements. The Social democrat government that came into power in 1994 soon changed this back to the old centrally regulated system.

This is clearly an obstacle for an institution which wants to be innovative, especially if it would like to recruit students from non-traditional groups. At the moment, there is much political emphasis in Sweden on the need for training of more engineers and scientists. At the same time, engineering programmes are having problems recruiting enough numbers of enough qualified students. To solve this dilemma, institutions would need to find more untraditional ways of recruiting - which, however, is not possible with the present regulations. Chalmers, with its innovative spirit, would be an excellent test bed for experiments of this kind.

I would suggest that Chalmers should try to obtain authorisation from the government to experiment with alternative admission procedures.

3.2 Broadening of the engineering programmes

It has already been pointed out that Chalmers has been rather successful in creating interdisciplinary educational programmes in new areas - even more so than the majority of other technical universities or schools in Sweden. But, as emphasised by the national quality audit, Chalmers has shown much less interest when it comes to broadening the traditional engineering programmes with components from the social sciences or humanities. The introduction of the yearly MTS Days is an display of good intentions, but it certainly not enough.

I would recommend a much closer cooperation with Göteborg University, enabling - and encouraging - students to include non-technical courses in their degree curriculum.

3.3 ICT in teaching and learning

Information and communication technologies (ICT) naturally play an important part in a technical university. Chalmers seems to have excellent computing resources; it has recently created its own IT Centre (after the closing-down of the joint Göteborg Computing Centre), and the Chalmers Media Lab is a highly competent and innovative department.

However, as already mentioned, Chalmers has not been very active with regard to the use of ICT in teaching and learning. A start has been made during 1998/99 with a course on "IT and pedagogy" in the programme of the Centre for Pedagogical Development but compared to other Swedish universities Chalmers has been remarkably slow in developing ICT as a pedagogical tool.

My recommendation would be that Chalmers should try to formulate an institutions-wide policy for ICT in teaching and learning. Setting aside funds for development projects in this area would also be a good investment for the future.

3.4 Open and distance learning

As pointed out in the introductory section of this paper, Chalmers has not devoted any attention to open and distance learning (ODL). There is reason to believe that this mode of distribution of educational opportunities will become more and more important in the future, particularly with the support of the ICT tools.

It seems odd that Chalmers - with its extensive programme of professional development for industry employees - has not at all tried to utilise distance teaching methods, which is a mode of delivery that should be extraordinarily well suited for professionally active people.

In my opinion it is high time for Chalmers to define its position with regard to ODL. My recommendation is that Chalmers introduce and develop distance learning as a primary mode of delivering continuing professional development for active engineers.

3.5 Quality assurance

The quality audit of Chalmers by the National Agency for Higher Education exposed very clearly the lack of a coherent and comprehensive quality assurance system at Chalmers. Such an approach to the quality issue, which is common in industry, would have seemed natural also in a university of technology, but as the visiting team remarked, at Chalmers no industry-influenced quality development work was to be found.

Such a statement does not mean that Chalmers' activities generally are low-quality - the contrary is true - but it points to a serious weakness in the way quality issues are managed in the institution.

My recommendation is the same as that of the audit team - that Chalmers should develop and realise a comprehensive programme for quality development.

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