

New Technologies and New Professions

The IRISH Experience

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Introduction

I am pleased to be here in Turin at this conference organised by CSEA and to have the opportunity to tell you a little of what Ireland has done about the problems caused by the spread of New Technologies and the need for New Professions. I intend to talk mostly about Irish efforts to build a computer industry and to train and educated young Irish people to work in it. I will explain what is being done in my own university in particular and will briefly mention a novel professional retraining course being developed by colleague and myself.

Ireland is a small country, located on the periphery of Europe, and having, unlike most of the countries represented here today, a young and growing population. Although the rate of population growth has recently fallen it is still the case that 50% of the population is under 27 and, as a consequence, the proportion of GNP spent on education is

among the highest in Europe. The resulting educational system achieves an excellent academic standard, assisted, I would suggest, by the traditional high regard with which the Irish people regard education. Up until quite recently however, and notwithstanding some famous Irish technologists in the past - such as Boyle and Parsons, the emphasis has been on the humanities and the professions. Only in the last 25 years has there been a concerted effort to promote technological education.

Technological Education.

Starting in the mid-60's, the Irish government, with the assistance of the World Bank and the European Investment Bank, put in place a system of technological education that was expressly designed to redress this imbalance and to equip Irish young people for the new employment opportunities that were expected to arise in the later decades. Ten Regional Technical Colleges (RTCs) and two National Institutes for Higher Education (NIHES) were built, equipped and staffed. The

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colleges provided courses of two, three and four years duration and, under the auspices of the National Council for Educational Awards, awarded certificates, diplomas and degrees, mainly in areas such as computing, engineering and business studies. In recent years the majority of the students are grant-aided by the European Community Social Fund and this has helped to raise the participation rate in third-level education towards the European average.

Just last year the two NIHEs were granted the status of independent universities and it is on behalf of one of these, the newly chartered University of Limerick, that I speak to you today.

Industrial Development

While these institutions were finding their feet, the Irish government, through its Industrial Development Authority, was making strenuous efforts to attract foreign, technology-based, industry. It is a measure of their success that so many of the best known names in the international market place have established principle, or major operations in Ireland.

Examples from the computer area include :

<i>Hardware</i>	<i>Software</i>
• Prime	• Ericsson
• Digital	• Lotus
• Apple	• Microsoft
• Wang	• Digital
• Motorola	• IBM
• Intel	• ICL
• Analog Devices	• Hitachi

It might be imagined that the lack of an industrial tradition might be a handicap to such developments but the contrary appears to be the case, as all of these companies state that the availability of well educated and eager young people is one of the major attractions of Ireland. Thus, although emigration continues to be a major problem, between 60 and 80% of those graduating from the colleges find employment in Ireland. There is even a significant, although still small, flow of returning graduates who bring with them expertise, and a wider awareness, that they have acquired while living abroad.

Another advantage that Ireland offers foreign industry is use of one of the most advanced telecommunications infrastructures in Europe. From having one of the worst telephone services twenty years ago Ireland now has one of the best and this, together with Fax and electronic mail, forms the basis for recent government efforts to establish Ireland as a major financial services centre.

University/Industry Links

Along with industrial development has come the need for industrially oriented research. Until recently, many of the foreign owned corporations have been slow to establish R & D activities in Ireland but this has begun to change and the Irish third-level educational institutions have begun to benefit from industrial sponsorship. The various EC funded research programmes (ESPRIT, MAP, AIM, RACE etc) have found a ready response also and have allowed Irish researchers to

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overcome some of the drawbacks of being in an isolated and peripheral region.

The NIHEs were charged with establishing industrial and commercial contacts and have succeeded in doing this, aided partly by the fact that many of the students spend all or part of their third year of studies in an "industrial placement".

Spin-off companies and science parks, aimed at speeding up the transfer of research results to industry, have also been set up and some small, but highly successful, Irish companies have emerged. This phenomenon is well illustrated at the new University of Limerick.

The Limerick Region

In general, Irish government is highly centralised. However the Limerick region, because of the establishment of the Shannon tax-free zone nearby, has had some measure of local autonomy. When the NIHE was established in Limerick, and it was given only a guarded welcome as a university was what was being sought, it formed the nucleus of an advanced technology area. In fact the university campus lies within a technological park where more than seventy companies are established. The university can therefore act as a support to local industry, both Irish and multinational. In the same area there is also a management and technology centre which runs advanced training courses, staffed by experts from both industry and academia.

Consultancy by university staff is actively encouraged and this is another important aspect of industry/university co-operation. As

an example of such work, the following section presents an advanced training course for practising computer professionals which is being prepared by my colleague Dr. Deasún Ó Conchúir and myself.

An Example Course

The client, a major producer of computer software, has a number of senior managers who manage software projects. Although well qualified and experienced, many of the managers have no formal training in the software area. The objective of the course is to impart, as efficiently as possible, a comprehensive working knowledge of current and emerging software engineering technology. The format we have chosen is a series of seminars, directed readings and hands-on exercises which are *individually tailored* to each participant's background and requirements.

The course is in two phases. The foundation phase is based on a single comprehensive text and aims to introduce or revise the prerequisite material. The continuation phase covers a number of specific software engineering topics (Specification, Design, Programming, Validation and Management). The first phase is expected to last six months and the second up to an additional eighteen months.

We believe that this course is a good example of how academic staff can assist the new professionals in adapting to the new technologies.

Conclusions

We have seen that, from a virtually nonexistent base, Ireland has made a rapid and effective start-up in the new technology-based industries. Although most of the companies are foreign MNCs these are beginning to locate more of their R & D activity in Ireland because of the ready availability of well-qualified staff. There have also been some successful small scale indigenous operations. University/Industry co-operation is actively encouraged and this takes the form of sponsored research, spin-off companies and consultancy.

Although many problems remain to be overcome before Ireland will have sufficient employment for all its young people, progress to date has been encouraging and it has definitely been shown that, with proper planning and investment in technological education, a small and relatively underdeveloped country can take its share of the new technologies and the new professions.

Thank you all very much for your attention.