

TECHNOLOGY LEADING TO HISTORIC CHANGES

The Beginnings of Computer Education in Slovenia

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Abstract: As early as the 1960s, Slovenia, one of the former Yugoslav republics, had already recognized computer science as being the most prospective technology. The World Computer Congress (WCC) held in Ljubljana in 1971, played a very important role in the promotion of computer science. Slovenian school authorities enjoyed relative autonomy in the former Yugoslavia and this made it possible for them to promote computer education. They also had strong support from civil society. This expressed orientation towards an information society was one of the major differences between Slovenia and the rest of the former Yugoslavia and one of the causes contributing to the attainment of Slovenia's independence.

Key words: WCC; Computer education; Computer programming competition, Slovenia

1. INTRODUCTION

The former Yugoslavia [Note 1], a socialist country, was determined to demonstrate its progressiveness, among other things, in science. Consequently, large science and technology centres were built in the capitals of its republics. The centre in Ljubljana, Slovenia, had decided to purchase a Zuse Z-23 computer as early as the end of the 1950s. This was actually the beginning of computing in Slovenia. (The pioneer times of computing in Slovenia are dealt with in a special round table discussion within the Slovenian Informatics Society, web page: www.hist-ri.slo.net.) Computer science was considered to be a field of strategic national importance. The applied mathematics team in Ljubljana was well aware of the significance

and attractiveness of the new technology; thus, it offered opportunities to a wide circle of interested young people. After the first IBM and CDC computers had been purchased in the 1960s, the Jožef Stefan Institute (Institut Jožef Stefan) became the first computer education centre in the country. The mission of the Jozef Stefan Institute is the accumulation – and dissemination – of knowledge at the frontiers of natural science and technology to the benefit of society at large through the pursuit of education, learning, research, and development of high technology at the highest international levels of excellence. The Institute is justifiably proud of its achievement of very early introduction of large computing facilities in Slovenia through pooling of resources and the formation of a national computing center.

2. THE IFIP WORLD COMPUTER CONGRESS IN LJUBLJANA

Ljubljana was the only city “on the other side of the Iron Curtain” where the IFIP World Computer Congress was held and that as early as 1971, and those facts had far-reaching consequences. Slovenian computer experts established excellent connections with highly developed environments. As one of the consequences of the IFIP World Computer Congress, the use of computers became the imperative of progress in Slovenian public opinion. At that time, some of the largest computer corporations opened representative offices for the East in Ljubljana (IBM, CDC, Digital, Bourroughs); soon afterwards they also licensed the manufacture of computers (ISKRA, DELTA, GORENJE). The WCC also had a large impact on education. Views on information technology represented one of the major causes for the growing differences between Ljubljana and Belgrade. Based on IT, Slovenia was very much in favour of modern managerial approaches, primarily of the openness to the world, which made a considerable difference in comparison to the governing practices in the former Yugoslavia.

3. THE BEGINNINGS OF COMPUTER EDUCATION

At the end of the 1960s, computer science was introduced in schools in a rather informal way. Young employees of the computer centre at the Jožef Stefan Institute (Bratko, **Rajkovič**, Lajovic, Hafner, Trampuž, Cokan)

offered to conduct optional computer courses in various secondary schools. Such courses, most of them consisting of approximately 40 lessons, usually included elementary computer functions and programming in FORTRAN. These activities received a favourable reaction from the Slovenian Board of Education and, consequently, the Commission for the Introduction of Computer Education into Secondary Schools was established. The Multimedia Centre of the Referral Centre of the University of Zagreb, where, above all, **Mužić** and Šoljan systematically researched the use of computers in education, had a positive effect on the development in Slovenia.

In 1971, the first seminar for computer science teachers was held. [1] At that time, computer science was taught in a quarter of all Slovenian secondary schools. In 1974, the first Slovenian computer science textbook was published [2]. One year later, when computer science was being taught at a half of all Slovenian schools, the first evaluation was carried out, and the report produced was presented at the IFIP (International Federation of Information Processing) Computers in Education Conference [3]. In 1973, the International Conference on the Use of Computers in Chemical Education was held in Ljubljana. The conference was led by Aleksandra Kornhauser, and it represented the basis for the establishment of the UNESCO International Centre for Chemical Studies (ICCS) [4].

At that time, few schools had their own computers. However, many publicly and privately owned enterprises that had computers offered schools the possibility of terminal and direct access free of charge and with the passionate commitment of computer experts, who were few in number at that time.

The introduction of microcomputers resulted in radical changes in this field. According to **Ivan Gerlič** [5], this period of time can be divided into two phases:

- the multiform phase (schools purchasing all types of computers available; e.g., Commodore, Apple, BBC, ORIC, Sinclair) and
- the uniform phase (after the decision was made to purchase only IBM-PC compatible computers with uniform MS-DOS operating systems).

In 1983, the first regulation governing hardware and software standardization in schools was issued. Then, computer education was introduced as an optional subject in all primary schools and as a range of compulsory subjects in all grades of secondary schools. In the framework of an all-embracing school reform — which however eventually proved to be rather unsuccessful — a 4-year computer course was introduced in 1981 in one type of secondary schools, and almost 2% of the total school population enrolled. The introduction of a computer science secondary school, probably

the first if not the only one of its kind in the world, was a confirmation of the euphoric openness to the new technology and of the great expectations that Slovenian society had for it. Computer secondary schools were in operation for almost a decade; many students who had successfully finished their education there continued their studies at the universities with success and are now among the leading computer experts.

The first computer course was introduced at the University in 1973; electrical engineering and mathematics students could enrol in it after their second year of study. Soon, independent computer departments and, then later, faculties with complete undergraduate and postgraduate programmes developed at the University of Ljubljana as well as at the University of Maribor. It is of special significance that Education Faculties introduced computer education for teachers as early as 1984. The state supported this development trend with a strong information infrastructure (www.arnes.si), which was widely accessible and free of charge, and with a very popular co-operative library system (www.cobiss.si), in which all Slovenian libraries have been participating since the end of the 1980s. To most people, this represents the first practical experience with the advantages of network implementation.

4. THE CIVIL MOVEMENT FOR THE USE OF COMPUTERS

The Association of Organisations for Technical Culture with its widespread network and the goal of popularizing technical innovations, and non-governmental organisations played a large, sometimes even essential, role in the introduction of computer education in Slovenia. In the 1970s, the use of computers became their major focus. They organised computer workshops and exhibitions (such as “**Računalnica**” and “**Računalniški dnevi**”) which represented a meeting-point for hardware and software providers and users, the latter consisting of teachers and pupils united in their common effort to master the new technology. As a consequence, computer clubs emerged and these were of great assistance to computer education. Nowadays, an exhibition referred to as INFOS (Informatika na Slovenskem, Information Technology in Slovenia) is still active, reminding one of past events in this field [6].

Programming competitions were particularly popular; the first ideas concerning these competitions can be traced back to 1974, earlier than anywhere else in the world, and the first competition was organised in 1977 [7]. Initially, these competitions were targeted towards secondary schools but later also to primary schools including first grade pupils. Without a

doubt, Pavel Azalov is wrong when he claims that Bulgarian computer competitions were the first ones of this kind in the world; they were held no earlier than 1982, and, by that time, Slovenia already had a long tradition in the field [8]. The highlight of these competitions was the first International Computer Olympics, held in 1988 in Nova Gorica, Slovenia. Azalov has also ignored this fact and claims that the first Computer Olympics were held in 1989 in the city of Pravec in Bulgaria [9]. Perhaps the misunderstanding has been caused by the name change, as, later on, these competitions were referred to as International Olympiad in Informatics (IOI); however, the Olympics held in Nova Gorica, have been assuredly documented with the publication of its “Problems in Programming” by the Wiley Publishing House [10].

5. CONCLUSION

In the former Yugoslavia, the introduction of ICT (information and communications technology) became a field for the confrontation between different concepts of social development. The field of computer science symbolised an openness to the world, good management practices and ideological neutrality. From this aspect, its significance was similar to “perestroika”, “**solidarnost**” or “svoboda vyrazu” in other socialist countries. ICT also had an impact on radical changes taking place in the former Yugoslavia. The meteoric rise of computer education in Slovenia led to an historic turn in the country. The idea that the existence of a small nation like Slovenia no longer depended on the “shelter” of some powerful state, but that creative participation in the global network of the information society could also help it survive prevailed. Slovenia, since its independence, has not only been admitted to the EU and NATO, it has also accepted the strategy of the transition into an information society and established the Ministry of Information Society. Excellent examples in this field can be found primarily in the countries of Northern Europe. Those who expressed such a vision as early as the 1960s can only regret that its realization required a long winding path in the modern history of the Balkans; this path, though, would have been rather different for Slovenians without the strong IT connection to the rest of the world.

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ENDNOTE

1. Slovenia was a part of the former Yugoslavia until 1991. In the former Yugoslavia, the republics (its constituent parts) enjoyed relative autonomy in the areas of the education system, science, culture, health service, etc., whereas the economic and defence systems and foreign policy were centrally governed. Although a sort of convoy strategy was enforced by the federal government, the stage of development achieved and development ambitions of the republics varied to a large extent. Technology successfully evaded ideological control; therefore, attempts for alternative breakthroughs were numerous, especially in more developed areas.