
JORDI FORNES¹ AND NESTOR HERRAN²

ABSTRACT

This paper analyses the establishment of the first computer science university degrees in Catalonia in 1976, in a context of political transition to democracy in Spain. Based on an oral history project and the examination of the school’s archives, we show that the development of Barcelona’s School of Informatics was the result of policymaking by the ATI, a powerful association of technicians in Informatics that pushed government and academy for formal studies inside University.

Until the establishment of university studies, and similarly to other countries, training in computing in Spain had been generally carried by computer manufacturers. By 1969, an Institute of Informatics (Instituto de Informática) was established in Madrid to provide official titles to the growing community of professionals, which by 1975 counted more than 100,000 people. Catalonia, a major industrial region, counted with an office of the Institute of Informatics at the Autonomous University of Barcelona (UAB) and two computer laboratories at the University of Barcelona and the Polytechnic University. Indeed, it was the stronghold of the ATI.

Barcelona’s School of Informatics (Facultad de Informática de Barcelona, FIB) was established at the Polytechnic University in conflict with the Institute of Informatics plans, and breaking with longstanding traditions of Spanish university: it was not a natural continuation of the studies at the Institute of Informatics, but a new centre at the UPC; it developed as new school instead of a specialty within the School of Industrial Engineering; it did not counted with a traditional curriculum, driven by the establishment of specific chairs, but with a very open curriculum based on credits and designed by a small team of professionals related to the ATI and with long experience in electronic data processing. All these ruptures can be understood by the especially troubled period of political transition, which was also reflected on academic staff—a blend of lecturers coming from both industry and academia—, studentship—generally mature students coming from other university schools and faculties—and even hardware: instead of the IBM or an UNIVAC

¹ DAC, UPC-BarcelonaTech & Centre d’Història de la Ciència, UAB.
² OSU Ecce Terra, Université Pierre et Marie Curie, Paris.
computers typical of early laboratories, the first computer chosen to serve researchers, students and staff was a DEC PDP-11, even if the company was still not established in Spain.

This innovative model started to decline in early 1980s. With a new legal framework, an important increase of students—now coming from high schools—and the stagnation in resources, the School began to reproduce patterns of other Spanish universities, and full-time academic lecturers push the old part-time professionals away.

INTRODUCTION

This paper deals with the origin of computer studies and professionalization of computing since the mid-1970s until the mid-1980s Spain, a period that is known in Spanish historiography as “the transition”. As we show, this transition applied in our case to very different domains. First, of course, there was a transition of political model, from a dictatorship to a liberal democracy, in a context of modernization and opening to foreign markets that had begun in the early 1960s (Tamames & Rueda, 2005). Second, there was a transition in computer architectures. Mainframes gave pass to minicomputers and very shortly to microcomputers with the boom of Personal Computers in the end of this period. This transition drove a third transition, which happened in the professional domain, which was closely tied to the emergence of the first university grades in Computer Science in Spain. We aim to show how these different transitions were related to each other, by focusing on a specific case: the origin of Barcelona’s School of Informatics.

The school was established in 1976, just a few months after the death of the dictator Francisco Franco, who had ruled the country for almost 40 years. His regime, deeply rooted in nationalist-Catholic ideology, had evolved since inception from a brutally reactionary and autarkic system to an authoritarian capitalism, with strong ties to the United States. This gradual shift can also be traced in the history of computing. Computerization of Spain had begun in 1958 with two major acquisitions, an IBM 650 for RENFE, the national railway company, and an UNIVAC UCT for the JEN, the national nuclear research institution. The early push of central state, characteristic of the autarchic period, had been followed in the 1960 by a development more based on private industry, in this case characteristic of the economic turn brought by IMF-led stabilization plans.

With computerization accompanying economic modernization, Spain’s counted by mid-1970 with almost 100,000 people working in electronic computing. As happened in other countries, these professionals lacked a formal university education in computing, and had been generally acquired their skills in

3 The 1975 census of the Spanish government counts 42,888 people working in computing, divided as follows: 1464 managers, 2745 analysts, 5856 programmers, 31542 operators and 1281 other operating staff. In addition, there were 54,900 registered workers working in punched cards data processing (gobierno, 1977)
computer companies such as IBM or UNIVAC. Spanish companies, relying generally on American machines, had also took advantage in the early 1960's of new installations, mostly IBM 1401 and Bull Gamma 10, to train their employees (Sales, 1980), and a few began to access the profession in university computer labs, the Institute of Informatics, private schools and self-learning.

In this context, the creation of the first schools of informatics arose as a result of diverse politic and professional agendas. On the one hand, there was a desire of the government to control and standardize the access to computing, a profession that was increasingly perceived as economically strategic. On the other hand, some professionals working in industry took advantage of the opportunity to develop their professional and academic careers. The history of Barcelona’s School of Informatics (Facultad de Informática de Barcelona, FIB) offers a good case for studying these underlying tensions.

The paper is organized chronologically: we first analyze the professionalization of computing in Spain and present the tensions between the Association of Technicians in Informatics and the Spanish government’s policy on computing, epitomized by the Institute of Informatics. In the following section we study the establishment of Barcelona’s School of Informatics by looking some of the key actors. The third section addresses the first years of the FIB and their social impact, a discussion that opens the last section, devoted to conclusions.

PROFESSIONALIZING COMPUTING IN 1970'S SPAIN

The origin of the computing profession in Spain can be traced to early data processing, which was already widespread in the country since the 1920’s. Transition from electro-mechanic to electronic machines took place smoothly in the 1960s, when manufacturers offered electronic computers as an alternative to their other products and differences were more about price, size and features rather than qualitative. This argument, which we borrow from (Sales, 1980), is based in the absence of a specific classification for electronic computers in the border customs lists (Dirección General de Aduanas) indicating no difference in treatment with the rest of accounting machines, the

---

4 The pattern is very similar as that of the United States. See Ensmenger (2001).
5 By 1972, Spanish market was dominated by IBM (67%), followed by Honeywell-Bull (11%), UNIVAC (9.5%) and NCR (8.5%). (gobierno, 1977).
6 In contrast with the lack of scholarly literature en the history of computing in Spain, the history of the school is generally well know thanks to the abundance of some commemorative works, published at its 25th and 30th anniversary (Nonell, 2002), (Porta, 2007), (López Garcia, 2002). Additionally, our project is also based in a collection of oral interviews to main actors of the early years of FIB, such as Antoni Olivé, former dean of the FIB and president of ATI; Miquel Barceló, aeronautics engineer, working at Bull and lecturer of the FIB since its establishment; Ton Sales, industrial engineer, working at IBM before its recruitment by the FIB in 1976; and Dolors Padró, secretary at the FIB since 1978, under seven different deans.
lack of a name to distinguish ones from the others in Spanish, and the presence of electromechanical elements in some of the early computers.

However, new installations soon revealed to be quite different than older accounting machines, and also requiring new professional skills. Being dominated by US manufacturers, the early training new professionals followed a pattern similar to the American one (Ensmenger N., 2010). So, manufacturers ruled the practice, making entry tests to everyone who wanted to follow their training courses and designing the syllabus. And, as it happened in the United Stated, manufacturers alone could not produce trained programmers fast enough to avoid salaries up. To put an example, by 1975 Univac applied salary increments from 14% to 20%, and headhunting was common.

Ensmenger has suggested that, in the United States, academic computer science departments, certification programs, and professional association were the trappings of professionalization, which had already been acquired in the United States by 1968. In Spain, one decade later, we identify a similar dynamics, but in this case assigning to the Association of Technicians in Informatics (Asociación de Técnicos en Informática) an especially important role in the achievement of computer departments.

The ATI was created in 1967 in Barcelona to gather professionals of computing in a broad sense, without distinction degree, but not including key punchers. It played a role similar to DPMA (Data Processing Management Association) in the United States, representing the largest professionals association of electronic data processing workers in Spain, but also covering functions of scholarly association. This is reflected by the launching in 1974 of Novática, a periodical published by the ATI that included both research articles and other devoted to professional concerns (Duque Tardáguila, 2009).

With political parties and unions forbidden by the regime, members of ATI conceived the association as a space of resistance to the dictatorship. Left-wing politics inspired political action of its members in greater or lesser extent, and opposed governmental policies on computing, epitomized by the Institute of Informatics, created in 1969.

The Informatics Institute had been officially established to cope with the “constant increment of electronic computers installed in the country” (ABC, 1969) and following the example of the British Computer Society professional grades, established in 1968 (Samet, 1998). However, unlike the BCS case

---

7 Terms like data processing systems (proceso de datos) were common, but the term computer -ordenador, borrowed from French ordinateur- still spent some years to be used. The term informática -also borrowed from the French- was not used before 1965 (Barceló García, 2008).

8 Bull’s series 300, which was conceptually a computer (with stored program), is a good example.

9 This salary increases were higher than inflation, which at the time reached 12%. (Matés barco, 2007).
university courses did not give exemption of part or all the examination. The Institute was a non-university entity, which merely provided validation and certification of the grades acquired by professionals. With its courses beginning in 1971, its curriculum, structured in 5 years, allowed obtaining five different grades: application programmer, system programmer, application analyst, and system analyst and system technician, which reflected prevalent business categories at the time.

Institute of Informatics had three delegations. One in Madrid, one in Barcelona and the last in Bilbao, what was a geopolitically cover of the three main industrial regions in Spain. Despite this ambitious setup, the Institute Informatics did not match its goals and obtained little support inside the profession (Berenguer, Coromines, & Garriga, 1975). The ATI become one of the most vociferous opponents. In Novática, the Institute of Informatics become a common subject, never for well.

THE CREATION OF BARCELONA'S SCHOOL OF INFORMATICS

On February 1974, the Spanish government created a commission to prepare a report about the training in informatics, which should recommend which areas should be inside University. In a context of “fin de régime” and social unrest—General Franco was agonizing, and workers and students increasingly calling for freedom and democracy- proposals for radical changes connected well with civic and academic culture. Proposals for reform multiplied just after the death of the dictator, and informatics was not spared. In 1975, Novática urged the creation of a union of informatics workers (Berenguer, Coromines, & Garriga, 1975). In the same number, the journal also published a detailed proposal for a computer science academic course (Puigjaner & Vergés, 1975). This proposal would become, with minimal modifications, the first grade in Computer Science of the new School of Informatics in Barcelona.

The origin of the School should also be situated, though, in relation to the existing infrastructure of computing studies in the Catalan universities. By mid-1970s, each Catalan university had its own computer laboratory and trained its graduate students. The University of Barcelona (UB), which was the biggest and oldest high education institution in the city, offered degrees of mathematics, physics and chemistry where some training in computing was offered. Its Calculation Centre, the CCUB (Centre de Càlcul de la UB) counted with an IBM 360/30 since 1973.10

Geographically close to the UB, the Polytechnic University of Barcelona (UPB) counted with a long tradition of automatic computing at School of Industrial Engineering, coming back to 1949, when professor Damià Aragonés i Puig developed electro-mechanic calculators. The UPB was connected since 1972 to

10 The University of Barcelona established a close relationship of with IBM, which materialised in other acquisitions in the following years. These machines allowed the university to connect, by 1984, to the EARN (European Academic & Research Network) and therefore to BITNET.
Madrid’s UNIVAC 1108, a terminal that provided the basis for the Calculation Centre at this technical university (the CCUPB, Centro de Cálculo de la UPB). The following year, they university acquired a Fujitsu FACOM 230-25 for the School the Industrial Engineering, where and several graduate students learnt scientific computing under professor Martí Vergés.

Finally, and situated in Barcelona’s industrial periphery, the Autonomous University of Barcelona (UAB) also counted with computer premises. Created in 1969 and ruled by Vicent Villar i Palasí, brother of a minister of education and science under Franco, counted since 1972 an UNIVAC terminal—a DCT-2000 Remote Job Entry—connected to the UNIVAC 1108 located at Madrid’s Data Process Centre. This same year, the UAB tried to open a Computer Science Department, but the Ministry of Education forced them to be a delegation of the Institute of Informatics and to follow its grades (Puigjaner, 2002).

The UAB was, then, one of the three delegations of the Institute of Informatics, the other two being in Madrid and San Sebastian. Studies of Madrid gave way to the School of Computing at the Polytechnic University of Madrid, and San Sebastian’s to the Faculty of Informatics of San Sebastian—initially depending of the University of Valladolid. So, at first sight, it seemed natural that the Autonomous University, with its privileged connection to Madrid’s Institute of Informatics, was in better position than the other to establish a degree on computer science. However, the events unchained in a very different way amidst the changing political context.

In the autumn of 1974 Gabriel Ferraté Pascual, by then chancellor of UPB, arranged a dinner at his home. Ferraté, professor of Automatics since 1965, was the director of the School of Industrial Engineering from 1969 until 1972, when he became chancellor. From this position, he participated in the commission to report on the training in computing in Spain. His partners at the meeting were also members of UPB: the mathematician Enric Trillas and an industrial engineer Ramon Puigjaner, who also was the president of the ATI. They talked about the Informatics Institute, and the background of informatics studies in Spain and eventually decided to prepare a five years curriculum, based in ACM and IEEE proposals, and as far as possible from the Informatics Institute one (Puigjaner, 2002).

During the rest of 1974 and all 1975 several meeting took place. The kernel of experts grew with Martí Vergés, director of the UPB computer laboratory, Manuel Martí and some others. The previously mentioned proposal of curriculum was published in Novática (Puigjaner & Vergés, 1975). In this paper, a brief review of the organization of higher education in the U.S. and in France was presented, followed by a determined critique of the Institute of Informatics and its curriculum. The main concern was the perceived need of different computer profiles in the following decade, which could be solved by promoting a training of technicians following the profiles of the ACM curriculum. Authors advocated for as an open curriculum, based on credit,
albeit they also showed how the training aims could be attained with the closed-path traditional curriculum typical of Spanish higher education.\footnote{Student choice of courses at university was so uncommon in Spain that professor Pere Botella even programmed a simulation to prove that it was practically feasible for a student to get a degree with choice among alternative courses (Puigjaner, 2002) (Vergés, 2002).}

In November 1975, Franco died. The government suffered deep reconfigurations and some pro-democratic and prestigious Catalan were called to Madrid. In January 1976, Ferraté was designed general director of Universities, a position that helped him to quickly establish a new School of Informatics. This movement was possibly aided by the fact that the department of computer science at UAB was not exactly a millpond. At the UAB, lecturers contested the director of the Informatics Institute, and each course was feared to be the last (Pérez Corbalán, 1996), (Botella, 1975), (Demócrito, 1975), (QP, 1977). Indeed, the UAB—a recently created institution, which hosted many young and dissenting professors—, was considered at the moment as one of the most rebellious to the establishment. In any case, the fact is that Ferraté’s henchmen (Vergés, Recober, Puigjaner, Trillas et al.) ended drafting the official curriculum (Pérez Corbalán, 1996), the decree establishing the school was published the 26 March 1976. The legal text also included the appointment of another prominent member of the ATI, the statistician Martí Recober, as dean.\footnote{Another question is why the school provided with a grade in Informatics instead of an engineering degree, like industrial or telecommunications engineering. The reason is that, in Spain, the creation of a faculties rather than schools was bureaucratically easier: it implied a ministerial decree instead of the approval of a law. An engineering school is a complex entity because their graduates were compulsory members of a professional association and had responsibilities, rights and duties granted legally. With rebellious ATI playing de facto the role of union and most important professional association, it is very possible that the government would prefer not to have a computer engineering school to worry.}

THE FIRST YEARS OF BARCELONA’S SCHOOL OF INFORMATICS

The establishment of Barcelona school of informatics was the result of a hasty process led by progressive professionals amidst a changing political situation. The unstable nature of the political and academic context explains in some extent the many innovations of the course in relation to the sclerotic landscape of Spanish academia. Having already discussed innovations related to the academic curricula, we present here how other school’s characteristics departed from conventional practices in Spain in other different domains, such as the recruitment of staff, the typology of students and the machinery acquired.

Once the school had been established, one of the first questions to be addressed was the recruitment of lecturers. This was initially done under the deanship of Martí Recober, who explained the procedure:
“It was through internal competitions, similar to those that are currently employed to select contract lecturers (...) their origin was very diverse: from the UPC -often with what we would call dual affiliation-, other Spanish universities, some who had just completed postgraduate studies abroad -above all PhD- and even foreign ones, such as the Chilean Tomas Lang, who came from an American university [Stanford]. There was also a group of part-time lecturers working in the public sector and the private sector.” (Martí, 2002)

The goal was to have two types of scholars. On one side they wanted to have some people with proven experience gained in professional practice or in other universities, and young postgraduates from abroad. On the other, it was considered to train young fellows who had the purpose of acquiring a PhD degree and develop their career in the new Faculty. This is why the first year the school opened -1976- only PhD students were admitted as students. They began from graduate to provide as fast as possible enough lecturers in computer science. In the meanwhile part-time lectures came from industry.

To some extent, the school recruiting policies conflicted with usual practices in Spanish university. The case of Tomas Lang, mentioned by Recober, is revealing. The Spanish ministry of education did not approve hiring him, as they found unusual and beyond the typical uses to hire a Chilean rather than a Spaniard. Otherwise, no rule prevented it and Recober's bureaucratic tenacity allowed for a contract to be signed.

Most of the lecturers recruited in the first years of the school were professionals linked to the ATI. In effect, the three first deans of the school combined this task with the presidency of the ATI: the aforementioned Recober (1976-1979), Ramon Puigjaner (1979-1982) and Martí Vergés (1982-1985). It is also noticeable that they combined these high positions in the school administration with their jobs in industry. This is the case, for example, of Puigjaner, who worked at Univac during his deanship.

The situation changed in the 1980s. A major reorganization of the Spanish university was promoted by the first socialist government (University Reform Act, made law in August 1983). This reform, which transferred the administration of universities to Autonomous Communities -regions with quasi-federal status-, instituted the practical gratuity of high education, gave university department full control in relation to the hiring of academic staff, and transformed most adjunct professors in associate professors with status of public servant. These changes, associated to an important increase of students, relegated the school model of part-time, computer professional lecturers (see figure 1).
In relation to students, the first years of the school also departed from its surrounding traditions. Courses at the school started in 1977 not by providing a first-year course, but a third, in which students who had passed the first two years of any engineering, faculty of science, economics or architecture could be admitted. According to one of the professors involved in the design of this policy, Antonio Olivé, one of the reasons of this policy was to prevent that mathematicians and physician –that would have teach the basic courses needed in the first year- to take control of FIB.

In any case, this policy, together with the announcement by the UAB that they will no longer impart courses on computing, left some first and second year students of the Institute of Informatics at the UAB. Their activism, epitomized by closures at the university premises avoided ultimately the closure of the computer science department at the UAB, giving rise to studies of informatics in both the UAB and the UPB (Pérez Corbalan, 1996).

From 160 students enrolled in 1977, inscriptions of the school augmented rapidly, with students doubling every two years (see figure 2). This growth was partially due to the admission of undergraduate students since 1979. Comparison with other engineering schools at the UPB suggest that informatics, such as the new degree in architecture –established in 1978- attracted many of the students that would previously been attracted by other engineering degrees.

Despite their more complete education, the first graduates of the school had to struggle for recognition and jobs. Professionals trained at the school were usable but not wanted. Compared to the early computer professionals, who were aeronautical engineers, industrial engineers, lawyers and architects who had been recycled for computer science inside the company, FIB candidates
were just rookies that threatened well-established professionals. By 1981, in a report of INI (National Institute of Industry) its deputy director noted that the computing profession still had a considerable offer of jobs accompanied by an escalation salary levels that would produce a certain intensity rotation (Rodriguez Cortezo, 1981).

Figure 2. Number students at different schools of the UPB, 1977-83

In terms of the hardware, the UPB counted with a long relation with IBM, which had began in 1963 with the acquisition of an IBM 1620. However, the election of a computer for the new school was a break off with this tradition. The machine of choice was a DEC PDP 11/60, much like the one that gave birth to the UNIX operating system. It seems that the FIB wanted to embed its students in the DEC culture, which at the time seemed to offer not only a business, but a cultural alternative to IBM domination. According to Professor Miquel Barceló, the decision was not only economical, but a political one:

I guess someone who has been in the United States has seen that there were many universities with Digital PDP and then campaigning to get here a PDP, as it coincided with that Digital wanted to come to Spain and almost gave it. There is a political orientation, and the orientation is to say IBM's are bad, they are bad because its computing is for business and that's bad, they want to make another type of computer science, well, these are opinions but I see it quite clearly.

The choice, however, was more difficult to justify in Spain for several reasons: DEC had not yet entered in Spanish market and would not until 1979. Other Spanish universities had IBM, which itself available presence in Spain. The last hurdle and not least, was the purchase approval by the inter-ministerial Commission for Informatics in Madrid, which aimed at promoting Spanish

---

13 Digital Equipment Corporation created a cult fascination, especially among scientists and engineers for their Spartan way of working. Almost no advertising, so confident all the quality of their machines, in small teams of engineers who maintained control over the projects at all times. It represented all that was not IBM, with their dress codes and punch cards. (Ceruzzi, 1998)

14 Barceló, oral interview.
The problem was solved discretely: any accounting entries in the university and state records included the equipment purchased. Officially, it had acquired a number of elements or accessories isolated, each described in great detail, without using the word computer or other technical terms that indicated that they constituted in fact a single system (Puig-Rovira, 2002). The computer was shared with the School of Civil Engineering, undergraduates, postgraduates and staff. Soon, with the help of the university chancellor, a purchase of a VAX 780 was made.

Other machines that were processed during this period: a Philips P2000 (1981) with a 2.5-MHz CPU, address bus of 16 bits and 128 KB of RAM. The first PCs arrived in 1984 and the VAX 11/750 (6 MHz CPU and computing real numbers in actual floating point) and the first terminal Tektronix. Patronage also occurred in the early years, some of the machines came via personal contacts.

CONCLUSION

We have made a prosopography of the founding and early years of FIB. From the precedents of computing training in Spain we have taken into account the impact of Informatics Institute and the very important role of ATI pushing government and academy for formal studies inside University.

The most characteristic features of this stage have been shown. Amid a climate of economic and political upheaval, Chancellor Ferraté aimed to create the school from scratch breaking ties with Informatics Institute, but also with Industrial Engineering School, but nourished in part of its experts and from electronic data processing industry with which it has sufficient contacts. The school also broke with the traditional curriculum, driven by the establishment of specific chairs, but with a very open curriculum based on credits. Even lecturers and students were peculiar. The role of the Association of Informatics Technicians was very important and lecturers came from industry and academia working as part-time lecturers; students came from other university studies and they added their experience to the classroom. Even the original character of the machine that would service the first years (a PDP-11 Digital Equipment Corporation, a company that had not yet been established in Spain) showed a temper.

This innovative model started to decline in early 1980s. With a very important increase of students –now coming from high schools- and the stagnation in

---

15 Telesincro was created in 1963 by the Catalan Industrial engineer Joan Majó (he was also a politician, socialist ministry of Industry from 1985 to 1986). They manufactured little machines for business computing, such as the FACTOR-P. In 1976 it was incorporated to SECOINSA, a company controlled by the Spanish government (Barceló García 2008).

16 The PDP-11/60 came with 256 KB of main memory, 56 MB disk, magnetic tape, diskette, printer and 12 terminals. Had an operating system installed RSX 11-M with multiple compilers (MACRO, LISP, PASCAL, FORTRAN, COBOL, ALGOL, BASIC ...) and scientific libraries (SSP, SPSS).
resources, the School began to reproduce patterns of other Spanish universities, and full-time academic lecturers push the old part-time professionals away.

**BIBLIOGRAPHY**


Garcia, À. L. (2002). Introducció a la història de la informàtica en Espanya. Introducció a la història de la informàtica en Espanya. UPC.


López García, Á. (2002). Introducció a la història de la informàtica en Espanya. Barcelona: UPC.


QP. (1977). Las facultades de informática son noticia gorda. NOVATICA.


2003.
