The Early Days of the Hungarian Software Industry



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Martin Campbell-Kelly's Periodization of the Software Industry (2003)

• **custom made software / software contractors** mid-1950s to mid-1960s

-one-of-a-kind programs for a corporate or government customer

• **software packages / corporate software products** mid-1960s to mid-1970s

-due to the appearance of IBM 360, program portability and "unbundling"
-a program that could be used without modifications
-automating common business functions, e.g. payroll, inventory management
-copies in the hundreds or thousands

• packaged software / mass-market software products from late-1970s

-due to the appearance of personal computers -cheap shrink-wrapped box of software -sold often in hundreds of thousands of copies

Software in the Eastern Bloc in the 1960s

- It is known that hardware lagged behind the West several years, but the situation regarding software was even worse
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This was due to multiple factors:

Software in the Eastern Bloc in the 1960s

- Stalin Era's known hostility towards cybernetics and computers
- Lack of appreciation for non-scientific computing
- Consequences of the characteristics of the planned economy
- 1970: 60.000 computers in the US, 6.000 in the USSR
- The (relatively) high number of different, incompatible computer makes, with very few of them reaching considerable numbers in serial production. This not only meant that there was no software portability, but that large software projects could not be "cost-efficient."
- This kept the software industry in the era of *custom-made software*, where only the most crucial and indispensable applications were developed

Computers in Hungary at the end of 1969

86 computers altogether in a country of 10 million

31 different makes

Only 2 types in double digits

(Év végi adatok) (Davab)			
Géptipus	1967	1968	1969
BULL-Gamma-3	1	1	1
BULL-G-Tambour	2	2	2
BULL-GE-115	1	12	13
ELLIOTT-803/B	2	2	2
ELLIOTT-4130	1	1	1
EMG-830			3
CII-90-40		1	1
CII-10010		-	3
GIER	2	2	2
HONEYWELL-2200			4
IBM-360/20		3	3
IBM-1130	· ·	1	1
IBM-1440	1	1	1
ICL-1901	1	1	1
ICL-1904	3	3	5
ICL-1905	1	1	2
LGP-21	1	1	1
м-3	1		-
MINSZK-2	1	1	1
MINSZK-22	2	3	3
MINSZK-23		-	1
ODRA-1013	7	7	7
RAZDAN-3	1	2	2
ROBOTRON-100	1	1	1
UMC-1	1	1	1
UNIVAC-1004	11	9	10
UNIVAC-1005	2	4	4
UNIVAC-1050	1	1	1
URAL-2	3	3	2
TPA			6
ZUSE-Z-23	1	1	1
Összesen	48	65	86

SZÁMITÓGÉPEK

Computerization of the Eastern Bloc in the 1970s: Unified System of Computers (Ryad)

- Need of an upward-compatible computer family is recognized
- Joint CEMA effort to computerize the Eastern Bloc
- By 1970 it is decided (by the USSR) to clone the IBM S/360 family
- Seen as a reasonable and conservative choice even in the West, as, beyond hardware, it should provide (almost immediate) *access to already existing software*

The mid-1960s brought multiple domestic computer development projects, some of them were original designs (EMG 830 below), some of them were clones (PDP clones by the Physical Research Institute)

EMG 830 DIGITÁLIS ELEKTRONIKUS SZÁMÍTÓGÉP

Az EMG 830 dígitális elektronikus számítógép bár műszaki felépítésében a második generációs gépek csoportjába tartozik, szervezésében számos harmadik generációs tulajdonsággal rendelkezik. Ezek a tulajdonságok lehetőséget nyújtanak a felhasználónak arra, hogy a számítógépet optimálisan üzemeltesse mind az adatfeld olgozás, mind a tudomán yos-műszak i számítások, mind a folyamatirán yítás területén.

Programkönyvtárának állandó fejlesztése az üzembe helyezés után is újabb és újabb lehetőségekkel bővíti a felhasználhatóságot.

A programozás SIMPLE assembler, EMG AUTOKÓD szimbolikus programnyelveken, a későbbiek során ALGOL és FORTRAN nyelven is végezhető.

A számítógép szervezése és viszonylag gyors működése, lehetővé teszi a gépen a multiprogram ozást, és a folyamatirányításban nélkülözhetetlen valós idejű (real time) program futtatást is.

Programkönyvtára tartalmazza

- a különböző szubrutinokat (perifériakezelés, rendező program, elemi függvények lebegővesszős és dupla szóhosszúságú műveletei stb.)
- hibakereső tesztprogramokat
- műszaki és ügyviteli programokat, valamint
- fenti programnyelvek fordítóprogramjait.



A számítógép felhasználását nagyban elősegíti, hogy az érdeklődőkkel való közvetlen kapcsolat útján az Elektronikus Mérőkészülékek Gyára Számítógép-értékesítési Főosztálya készséggel áll a felhasználó rendelkezésére.

A géppel való megismerkedés céljából az EMG különböző szintű tanfolyamokat rendez programozók, operátorok részére.

- Central Statistical Institute recognizes the need to computerize the country
- Founds INFELOR (Information Processing Laboratory) in 1965 to:

-actively seek out and promote possibly useful software applications to departments of the government
-survey new Western developments in the field software
-survey computational modeling (operation research and process management)

• INFELOR is considered to be "the first Hungarian software house" in the literature

• *Computer Technology '68* conference in Esztergom, Hungary

-considered as a milestone in Hungary

-comprehensive exhibition and conference, showcasing the entire spectrum of computing technologies in the country

-launched the domestically developed computers

-founding of the John von Neumann Computer Society (which still exists today and is a member of IFIP, CEPIS, IEEE etc)

The Institute for the Coordination of Computing Technology (SZKI), the central professional organization of Hungary's Ryad participation, was founded in 1968.

Its role included:

- coordinating the hardware and software development and the manufacturing of the Hungarian Ryad computer (which was based on French CII license)
- responsibility for the documentation and the approval of the machine and its software

Hungarian "Software Industry" in the 1970s

No software industry comparable to that of the West.

Some of the software development is akin to that of the West in the 1960s, and some of it is relatively modern. It is a mix of the following three different "streams"

- custom-made software for government and large factories/enterprises
- software adaptation for clones of Western computers
- software-export to Western Europe

Custom-made Software in Hungary during the 1970s

Due to the late computerization of the country, many government databases, inventory and payroll managing programs for factories and large enterprises were developed during this decade

Due to the small size of the country (with its own language), production of "software packages" in large numbers was not a realistic option

By the end of the 1970s there was enough domestic experience with inventory and budgeting software that, for example, INFELOR had modular programs that could be easily tailored to the needs of particular enterprises.

Thus an intermediate stage was reached between custom-made software and software packages (about 40 enterprises used a version of INFELOR's payroll program by the end of the 1970s)

Attack of the Clones

The promising domestic original computer developments did not take over the Hungarian market

The most widely available and easily accessible computers were clones:

-PDP clones by the Physical Research Institute

-IBM S/360 clones manufactured by Hungary and other CEMA countries



Információelektronika 1969/3

ESZ-2020

ESZ-7070

ESZ-5551 ESZ-5057 E\$7_551

ES7_50128

ESZ-6012

ESZ-701

ESZ-607

ESZ-7022 ESZ-703

PDP-8 Clones

- The Physical Research Institute manufactured PDP-8 clones from late 1968, and became a relatively successful undertaking within the Eastern Bloc throughout the 1970s and 1980s
- The developers of the PDP clone became members of the DEC User Society (DECUS) already in 1969, gaining access to most of the software that was already available
- Beyond the software they gained access to through DECUS, domestic software developed for these computers consisted mostly of scientific software (including medical research) and the use of these mini-computers as terminals in nuclear and power plants, and state-wide government databases

IBM Clones (Ryad)

- Ryad computers were accelerating the computerization of the country from the mid-1970s, providing many factories and enterprises with their first computer centres (often with the government's financial support)
- As part of the Ryad bureaucracy, every participating country had an "enterprise" for importing and installing Ryad computers and providing customer service for them
- In Hungary, part of this enterprise was OSAK (National Software Archiving and Maintenance Service), which was responsible for providing software, *mostly through adaptation*

IBM Hungary

~ in the country since 1936

~ never left the country, but were not selling computers

IBM software was adapted <u>legally</u> by OSAK, in cooperation with ~ A technika és gazdasági élet feladatainak óriási mérete és sokrétűsége szükségessé teszi a matrix jellegű problémák minimális erőfeszítéssel és maximális eredménnyel történő megoldását.

Az IBM/360 MATLAN (MATès LANguago Jeget tesz czeknek a követelményelenek. A MATLAN ditaláno célő program a matrisok kezetésré és a velük való számláknoz. Bgy fordín-és egy végrehajtó programból tevődik öszez. A leheiéges utatálsok nagy száma rugalmas czközt nyúji a matrix generálisához, kilomfele martir műveletekhez. Programvezérlési és ellenőresít tartulmaz. A MATLAN nyelv képességei és sajátosságai közül kiemelünk néhányat:

 - 8 aritmetikai utasítás az inverzió és adetermináns kiértékelés céljaira, - 12 elemmeghatározó művelet, amely maximális elemszám csetén is biztosítja a hozzáférést az egyes elemekhez, - 12 elemi függvény,

 – 19 adatáthelyező és műveleti utasítás.

 13 utasítás az adatdefiníciókhoz, tulajdonságok meghatározásához,
 7 instrukció az input-output műveletek ellenőrzéséhez és vezérléséhez,

4 iteráció kontroll,

 – 5 szubrutin kontroll,
 – 4 utasítás az Operating Systemher

A MATLAN maximilian 32767 soros és 32767 onlopos matrixokat tud kezdni. Ha matrixok felul műják a magtároló kapacitási, automatikana közerlen hozzáferésű tárolot haznál. A matrix elemi valdak vagy komplexek, és egyszerrű vagy dupla pontoságdak lektutek A matrixok egyes különleges sájatásgai meglédhetől. (Például diagotal), háromszógmatrix.)

A MATLAN-t az IBM/360-as rendszerre tervezték, és az Operating System támogatja.

Felvilágosítás:

IBM MAGYARORSZÁGI KFT.

Szervezési Osztálya Budapest V., Vécsey utca 4. Telefon: 110–843, 120–978



Információelektronika 1969/3

Software-export to Western Europe

Throughout the 1960s Hungary purchased some Western computers, primarily for its most important computer centres

These purchases were usually quite haphazard, mostly due to a shortage of Western currency in the country

To remedy this issue, Hungarian institutions tried to compensate the Western sellers by participating in the software production for the machines they were to buy

(This practice was supported by the government and the so-called New Economic Mechanism)

Software-export to Western Europe

The first successes:

- In the early 1970s Hungary (SZKI) paid 40% of the French CII (the base of its Ryad participation) license in research and development services¹
- In return for a few Facom-R minicomputers, INFELOR developed the macro-assembler, linkage-editor and loader for these computers for Fujitsu in 1971
- SZKI also paid Siemens in software development for a 4004 in the early 1970s (the base of SZKI's computer centre)

¹At the public introduction of the next CII computer at the 1971 SICOB trade show in Paris, SZKI employees participated in the installation of the computer on site.

Software-export to Western Europe

• These projects were used as references for obtaining further software development contracts (by SZKI and INFELOR):

SZKI–SIEMENS cooperation until the 1990s, Philips, DATA-SAAB, Deutsche Telekom, Messerschmidt etc.

- This brought a Western computer and work culture to the country
- It was financially benefical for programmers, who spent weeks/months in Western Europe, earning in the local currency
- All this was supported by the government (e.g. unlimited exit travel passports)
- During the 1980s multiple "body-shops" were established in West-Germany (for cca 150) Hungarian programmers

Quick outlook to the Software Industry in 1980s Hungary

- More access (legally) to Western software
- Many features of the planned economy were relaxed and private companies (Ltd's and LLC's) were allowed
- A few highly specialized products were able to compete internationally
 - Graphisoft (architecture CAD software)
 - Recognita (Optical Character Recognition (OCR) software)
- The creators of these programs founded their own small private companies ("start ups") and became independent from their original institution (e.g. from SZKI, INFELOR etc.)

Conclusion

• Providing software was recognized as an important factor in the computerization of the country by the late 1960s

• However, Hungary did not have a modern software industry in the 1970s in the sense of the West

• Instead, it had a mix of custom-made software creation, software adaptation for the clones of Western machines, and a financially important, but rather irregular software-export to Western Europe

Thank You for Your Attention!