Ericsson, the Technology Integrator for the Office of the Future:
EIS AB and Dreams on Computer-Telecom Convergence in the 1980s

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1. Introduction

January 1st 1982 was thought to become a glorious and memorable day in LM Ericsson's history, but is today seldom remembered or even mentioned. That was namely the date when Ericsson's adventure in the computer industry officially began, with the creation of "Ericsson Information Systems AB" (EIS), a company born from the merger between two LM's divisions and the newly acquired Datasaab. That this adventure lasted only about 6 years does not makes it though less important in Ericsson's 125 years long history. For the enthusiasm, the fervour, the energies and the money thrown into the fight by LM in this epoch-making project, this period can be compared with whole decades in Ericsson's previous history. Ericsson's ambition to develop and market worldwide Swedish computers and even a PC was also sustained by public authorities that saw the possibility to establish a strong Swedish computer industry. But this adventure is nowadays seldom remembered because of the unsuccessful results EIS attained during its short life, to the point that it was dismantled and partly sold in 1988 to Nokia. This paper aims though at explicitly penetrating the details of what actually happened during those "roaring years" in the mid 1980s. Ericsson's bet on the computer and office automation business turned out to be unsuccessful for many reasons, but this paper focuses on those related to technology and business strategy.

1.1 The purpose of this study

By focussing on EIS, this study highlights LM Ericsson's relation to information technology or, more precisely, to computerised information systems. During its long history, Ericsson has always had strong connections to this technological area, at least because its main products covered the related field of telecommunication. The EIS adventure can be therefore related to other tracks in Ericsson's history pointing at the entrance on the scene of the new digital technology and of all solutions related to it: this can also help to understand why LM management decided to take the step into the new and unexplored area of computers and office automation. The investigation of this paper is though limited to the decade immediately preceding the birth of EIS. It is in fact from the beginning of the 1970 that the convergence between computer technology and telecommunication has gained momentum (as witnessed by e.g. the Arpanet project, the predecessor of today's Internet, presented in Hughes, 1998: 255-299). It is no wonder then that Ericsson, in the beginning of the 1980s decided to leverage on its competence in fine-mechanics, telecommunications and electronics and to exploit them in the fields of data and information systems.

The relation between Ericsson and the IT field is highlighted in this paper by looking at the connections that have emerged right before and during the EIS venture with a range of other computer and IT-oriented firms, acting as suppliers (e.g. LM production units), customers (e.g. Televerket), partners (e.g. Honeywell) and competitors (e.g. IBM). A business network approach (see Håkansson & Snehota, 1995) is thus implicitly adopted. The method used for

data collection relies on archive search performed at Stockholms Företagsminne and on one in-depth interview with an individual employed at EIS. The most important material is offered by company internal reports (produced at Datasaab and EIS), EIS personnel newsletter (ERINFO) and LM Ericsson own scientific review (Ericsson Review). Also a doctoral thesis (Dahlgren & Witt, 1988) has provided important insights, especially about the merger between Datasaab and the "G" and "S" divisions at LM that originated EIS. All the sources are reported in detail in the reference and source list. This paper is arranged in the following way: section 2 presents the situation before the creation of EIS AB and section 3 follows in detail EIS' development, while section 4 analyses these historical accounts. The concluding section 5 puts EIS in a historical perspective and faces the broader issue of the role that the EIS adventure played for Ericsson's *identity*.

2. Ericsson, IT and computerised systems before the birth of EIS

A complex connection between Ericsson and the field of information technologies can be traced back in time to a few decades before the birth of EIS in 1982. Some of this connections were developed internally in LM's R&D laboratories, others derived from co-operation and contacts with important suppliers or customers requiring computerised solutions for their telecommunication needs. Other connections to the IT field were simply the result of strategic visions and dreams elaborated by Ericsson managers.

2.1 LM's technology and strategy path towards electronics and computers

During the 1970s an increasing amount of Ericsson's products and solutions began to rely on microelectronics and digital technology:
-AXE, the digital telephone switch for public networks, was introduced in 1970 after a long co-operation with the Swedish Televerket (Meurling & Jeans, 2001: 272).
-This required establishing LME internal research, development and production of microelectronic components, such as microchips and processors. This was done at the former RIFA, later called Ericsson Microelectronics, located in Kista, staring from the early 1970s.
-The Mölndahl factory, established in the 1950s to supply the Swedish military with advanced radar, telecommunication and computerised equipment, in 1970 started the production of an advanced computer (the UAC 1601) to be used for the ground control system of the AJ-37 Viggen fighter plane (Meurling & Jeans, 2001: 247). Even if the computer was later rejected by the military, it was developed into the UAC 1610 that ended up being used for industrial applications such as process control and for the management and control of traffic in Ericsson's own telephone networks. This very computer would later become a core system for all future digital telenetworks installed by Ericsson, especially after the creation of EHPT, a joint venture with Hewlett-Packard, that led to developing UAC 1610 into the very successful AOM 101, used for administration of complex nets where many AXE switches were installed (Meurling & Jeans, 2001: 301-303).
-A large R&D project about PBXs (Private Branch Exchanges) was launched in the mid 1970s. The aim was to develop an advanced digital switch, later named MD110, to be sold to private organizations, thereby directing Ericsson's interests not only to the digital technology, but also to a completely different customer group than state owned telecom operators and the military. Organizations and their internal communication problems entered explicitly thus Ericsson's agenda, in the shape of PBXs. This point further contributed to directing Ericsson's

strategies to what became later EIS, a unit conceived for addressing all the possible needs of an organisation in terms of office automation and internal communication.

While Ericsson was walking down this technological path, in the late 1970s Ericsson's management became increasingly convinced that a convergence between the technical fields and businesses of *computer-based data processing* and *telecommunication*s was imminent. The convergence was identified, by then, in the "restricted" space of the *modern office environment*. Ericsson's view was partially affected by the company's own experiences and product development know-how in data processing. Since 1976, Ericsson had started the development of such products as ERITEX 10 "for Teletex and Word Processing", a computer-telex terminal, whose software Ericsson developed totally internally (Augustinsson & Sjöstrand, 1982). This product was clearly a hybrid between a computer capable of word processing and a telex machine. Ericsson's view was that such devices as ERITEX 10 could be integrated in the "office of the future" around Ericsson's PBXs, such as MD 110, and other terminals (Augustinsson & Sjöstrand, 1982: 202).

In the early 1980s, Ericsson developed the ambition to fully control and exploit the computer-telecom convergence in the "restricted" space of the office environment (Ramqvist & Thorén, 1981). Ericsson's strategy aimed at providing *fully integrated and complete office solutions*, covering everything from telex-machines to computers terminals, from PBXs to minicomputers, from process control software to operative systems, from word-processors to printers, from banking software to administrative application packages. Of course, in 1980 the LM group did not cover all these technical solutions, which turned the interest of Ericsson's strategists to other specialised firms that could be potential candidates for an acquisition.

But also other reasons, apart from mere technological visions and convergence dreams, induced LM to consider the option to diversify its business into the IT and computer industry. Ericsson perceived that the telecom sector would have met a much lower growth rate in the years to come than earlier in the 1970s. Liberalization of state telecom monopolies and increased competition were also considered as negative outlooks for the telecommunication business. A further threat to incumbent telecom suppliers was represented by IT giants, like IBM, who seemed interested in entering the telecom sector thereby exploiting the anticipated data-telecom convergence from their own "side". The computer industry, on the other hand, was projected to grow much faster all the way into the 1990s, as a result of large expected investments by most corporations and organizations trying to increase productivity in office work. Ericsson had the firm idea that those who would quickly establish a strong presence in this business would end up with dominating it and exploiting its enormous possibilities[1]. Another important factor that eventually convinced Ericsson of the viability of its new diversification strategy was the example offered by other telecom equipment producers like the Canadian Northern Telecom[2] that had already entered the computer business: and Ericsson did not want to be left behind. Entering the computer and IT business was thus not only the result of a technological imperative (the convergence data-telecom) but appeared also as a sound and almost necessary business strategy, backed by LM strategists, such as Lars Ramqvist (later to become CEO and President for the whole Ericsson group in the 1990s).

The strategy that LM executives laid down to enter the computer industry was thus based on a strong belief on the technical and functional convergence between telecom and data solutions,

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[1]A forecast published on ERINFO in 1983 suggests that players in the computer industry will be down from 100 to 10 dominating actors in a few years.

[2]Also Nortel never reached profitability, eventually divested and lost a fortune in its own computer adventure.

including all office automation equipment. This led some Ericsson executive to coin the expression "paperless office". In practical terms, the diversification strategy was to be accomplished by exploiting the already established technical competence in the LM group's divisions already dealing with IT and computerised systems and by acquiring other companies already present in the computer business. Let's now review both of these key resource and competence bases on which EIS will be grounded, in sections 2.2 and 2.3.

2.2 LM divisions for private exchanges and data systems

Some of the products and solutions described above and that should have become bearing elements in Ericsson's visions for the "office of the future" were produced by two of Ericsson's 5 divisions in 1980: "G" and "S".

The "G" division had existed since the mid 1950s and dealt with development and marketing of private exchanges (PBXs) and telephone terminals. The digital PBX MD 110 was its biggest project, started in 1976, but not yet ready to be marketed. Other PBXs were though sold with relative success to single organizational customers such as hotels, banks and corporations. Telephone terminals were the bulk product sold worldwide to public telecom operators, often as a consequence of the deals for public telephone networks covered by LM largest division "X". The "G" division had though no production facilities, being dependent on the production resources of other divisions in the group, and virtually no sales organization, since its products were sold worldwide by LM subsidiaries taking care also of larger public telecom systems. The "G" division had been struggling with low profitability throughout the 1970s, as a consequence of limited resources for R&D and for marketing of own products. In 1981 it had a turnover of 757 million SEK[3] and just over 400 employees.

The "S" division was LM's smallest and newest one. It was created in 1980 and dealt with information and computer systems. The key products were datacom equipment such as modems, private data networks (based on Ericsson's solution for packet-switching called ERIPAX) and office automation products (such as telex machines, computer screens and peripherals). The largest project was ERITEX (see section 2.1), but no sales were achieved because of its too advanced and sophisticated nature. Like "G", also the "S" division did not control any production plant and employed only 40 persons in R&D. The limited sales volume of 70 million SEK was obtained via the other LM sales subsidiaries.

2.3 Datasaab AB: a colossus in search of balance

While Ericsson was struggling with the "G" and "S" divisions and was developing its visions and plans for a possible entrance in the computer and IT industry, other Swedish actors had already been established in this arena for many years. Apart from the local subsidiary of IBM, the largest of these players was, in the beginning of the 1980s, Datasaab AB. In 1981 this firm had a turnover of 1.2 billion SEK and employed 3,400 people. Datasaab developed, produced and marketed four core products: *the Alfaskop computer terminals*, IBM-compatible dumb terminals connectable to most minicomputers of that time (sold in 1981 for over 400 million SEK); *interactive data systems* for air traffic control, simulation, hospital and military applications (100 million SEK); *banking systems* including back- and front-office software

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[3]All figures in this paper are expressed in SEK (Swedish Crones) as valued at the referred date. Values in current SEK can be obtained by multiplying by a factor between 2 and 3.

and hardware applications for banks and financial institutions, all the way to ATM machines (400 million SEK); and *business systems*, application packages and minicomputer hardware for administrative functions, including invoicing, production scheduling, order and inventory management and bookkeeping (300 million SEK).

This heterogeneous product range was the result of a merger accomplished in 1978 between Stansaab AB and the Datasaab division of Saab/Scania. When Ericsson appeared on the scene to acquire Datasaab AB, these two were still basically acting as two separate firms, with different strategies, routines, production systems, R&D etc. No substantial synergies had yet been attained between the two businesses: rather many conflicts were still there just to be discovered by Ericsson, who substantially acquired two separate divisions in 1981. It is thus more interesting to consider the two separate units composing Datasaab and their background.

Stansaab AB, with production plants and seat in Järfalla (near Stockholm), had been created in 1971 by ITT, Saab/Scania and the Swedish state. Stansaab AB oriented its business towards stand-alone computer terminals (the Alfaskop family) and interactive data systems (IDS). Alfaskop was sold mostly in Scandinavia, where it had large market shares (especially in Sweden), to institutional customers. The largest ones were LM Ericsson, Scandia, SAS and many Swedish state and public agencies. The key feature of Alfaskop was that it was IBM compatible but it cost less than IBM terminals, which attracted customers purchasing in large quantities. IDSs were instead advanced systems developed completely and from scratch according to customer technical and functional requirements. The most important customers were the Swedish military, Luftfartsverket and, quite interestingly, the Russian Aviation Authority (who signed an order worth 300 million SEK in the mid 1970s). During its short history, Stansaab AB had been facing great economic problems. Despite the steady increase in sales, the business was in the red. Only Alfaskop was generating a minimal positive cash flow, but these terminals had often to be sold with strong price discounts.

The Datasaab division at Saab/Scania, located in Linköping, had been created as a separate unit inside the Saab/Scania group in 1970. It had a quite broad product range: banking systems and hardware, administrative application packages, industrial applications (such as programs for NC-machines) and military systems. Banking systems were sold almost exclusively in Scandinavia, as a result of a large contract with the Swedish saving banks associations (Sparbankerna) dating back to 1969. Competitors (IBM, Nixdorf and Philips) in this business were much larger and better positioned. Administrative application packages were also sold, from a disadvantageous competitive position, only in Scandinavia and usually to small and medium-sized customers. The too often performed adaptations never allowed profitability in this sector. Similarly to Stansaab AB, also the Datasaab division of Saab/Scandia was in the mid 1970s in clear economic troubles, which were made even worse by the substantial lack of interest for its business from the group headquarters.

The merger between Stansaab AB and the Datasaab division was thus a matter of survival for two seriously "ill" firms. Datasaab AB was born in 1978 with Saab/Scania and the Swedish state as owners on a 50-50 basis. The largest Swedish developer and producer of computer and information systems was thus created. Hopes were especially high from the Swedish state's side that financed this project in order to keep alive a "Swedish computer industry". The economic problems faced by Stansaab AB and the Datasaab division separately continued though for the merged entity that cumulated losses for as much as 800 million SEK in less than four years. As already mentioned, no integration between the two firms was achieved, most likely because of their two heterogeneous technical bases and market

orientations: they had almost no customer or customer group in common and their products were neither compatible nor complementary. The only products for which a concrete integration was possible were Stansaab's Alfaskop and Datasaab's business systems, but while Alfskop was sold to large customers, Datasaab's application packages were directed to SMEs and while Alfaskop was fully IBM-compatible, Datasaab's business systems were not. No wonder then that, when Ericsson knocked on the owners' door showing interest in acquiring Datasaab, LM's emissaries were very welcome.

This is the situation in terms of technologies, products and markets that Ericsson was facing right before starting its adventure into the computer business, to which we turn in the next section.

3. Ericsson Information Systems AB: a dream come true?

The negotiation between LM Ericsson and Datasaab's owners had started in early 1981 and in June it was officially announced that Datasaab AB was to enter the LM group. For 300 million SEK, Ericsson acquired all four products and divisions of Datasaab, but the interactive data system (IDS) division was immediately integrated into LM's SRA division, dealing basically with the same type of solutions and customers[4], and was not involved at all in EIS. On January 1st 1982 the other three Datasaab's divisions (Alfaskop, bank systems and business systems) were merged with LM's two divisions ("G" and "S") into a new company called "Ericsson Information Systems AB", with headquarters in Bromma, near Stockholm and production sites in Järfalla and Linköping. EIS had a total of 3,900 employees and budgeted sales for 1982 of almost 3 billion SEK, which made of it the second largest computer company in Scandinavia, second only to IBM. Ericsson simultaneously re-organized its group into a series of "business areas", of which the newly created "information systems area" (called BI) was covering almost 30% of LM's turnover and was second only to the "public telephony area" (called X). The BI-area included, besides EIS (its largest company) also other less related products and businesses: Autotank AB (automatic payment systems for gas stations), Ericsson Telemateriell AB (time and security systems for police, fire departments etc.) and Programmatic AB (software).

3.1 EIS' visions and the challenges to the creation of integrated office solutions

A first look at EIS and LM's BI-area reveals a great heterogeneity of solutions, products, technologies and potential customers and applications. It was though inside EIS' product range and offer that all these different products and technologies (computer terminals, telecom switches, datacom networks, minicomputers for banking and business applications) should have come together and be integrated, according to Ericsson's strategy (Ramqvist & Thorén, 1981). The only thing that held these heterogeneous solutions together was LM's vision of the "office of the future", where all these artefacts should find a place, be integrated and work together. EIS aimed at becoming the leader in supplying *complete and integrated solutions* for automating offices and creating the "paperless office". In more concrete terms, all the products reviewed above, in sections 2.2 and 2.3, should have been integrated around a central hub, Ericsson's digital PBX MD 110 (Elfgren & Fernius, 1987) that could function also as a sort of minicomputer, surrounded by many terminals of the Alfaskop or ERITEX 10 type

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[4] To a certain extent, the IDS division of Datasaab AB was a competitor that SRA could thus take over.

(Augustinsson & Sjöstrand, 1982)[5]. Creating "integrated office solutions" required thus, first of all, the *consolidation and co-ordination of the product lines* that EIS inherited from LM's "G" and "S" divisions and from Datasaab. EIS executives were though convinced that each of the firms' products would find easily a place and play a well-defined role in Ericsson's planned offerings for the future automated office (Ramqvist & Thorén, 1981: 158).

In reality, a lot of challenges and problems were still to be faced and solved for this scenario to become true. Apart from consolidating product lines, one of the biggest challenges EIS was facing was the quantum leap that being in the new computer business was implied compared to telecom, where LM had an established name, over 80 years of experience, well developed capabilities and an impressive customer base. In the IT and computer business, the risk was that Ericsson would need to be depended totally on the newly acquired Datasaab AB, with all its clear limits in terms of name, experience, capabilities and customer base. Entering the computer industry would have implied a completely different way of doing business, especially in the following respects:

1- *technological competences:* from the areas of telecommunication, fine mechanics and electronics in general, EIS was now expected to master semiconductor and microprocessor technology, software development, data communication (e.g. packet-switched technology) and even user interfaces such as ergonomics. Datasaab AB was really competent only in the area of ergonomics, thanks to the success of its product line Alfaskop.

2- *customers and customer relations:* from about 100 state-owned telecom operators, the target customers for EIS would be now private and public organizations, numbering up to 100,000 potential customers worldwide. Orders from telecom operator could be worth billions SEK and were obtained after years of negotiation with LM in the context of long-term relationships with repeated deliveries. Orders from EIS potential customers would be worth at best millions SEK and be obtained in shorter-term relationship with single deliveries. Only the Alfaskop and, partially, the business system divisions of Datasaab AB had concrete experience of this second type of customers and customer relations.

3- *product development:* from highly complex systems for whole telephone networks that were developed according to highly competent customers' specifications, now EIS was to focus on less complex but integrated office solutions with more standard components that needed to be developed according to general functional requirements and with a strong low-cost focus. Whereas the typical LM telecom equipment had in the 1970s a lifecycle that could stretch over a decade or two, EIS's solutions were expected to have lifecycles of at best 5 years or, as it should prove with the PC, even shorter, just half a year. This should turn out to be a very difficult issue to handle for EIS, since it put enormous pressure on EIS' R&D to radically cut the time to market for all of its new products, from LM's typical 5-10 years[6] to less than one year.

4- *production and logistics:* from mostly internal production at LM factories and a high degree of vertical integration, EIS needed instead a higher extent of outsourcing and efficient purchasing strategies in order to identify inexpensive components and to face the cyclical scarcity of some semiconductor chips. Production planning for telecom equipment could easily be done on a whole year basis, given a limited number of large customer orders; EIS had instead not this luxury and needed to perform a vigilant and careful production, purchasing and logistics planning with less than a month of advance.

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[5]ERITEX 10 was originally chosen for this role, also because of the large R&D investments that LM had poured into it since 1976. But it did not stand a chance against the strong brand, low price, established base and sales success of Alfaskop. ERITEX 10 was thus slowly phased out.

[6]The digital PBX MD 110, which entered EIS' product range, took more than 8 years before it could become a viable product and not just a "black box" over which customers got upset for its many flaws.

5- *sales and distribution:* LM was used to personal selling activity conducted face-to-face with its handful of telecom customers, usually both centrally in Stockholm and by the sales subsidiaries; EIS was instead targeting a much larger pool of potential customers, which required the use of indirect channels to be reached. For this purpose EIS exploited a range of local sales subsidiaries abroad and, especially after the acquisition of Facit AB in 1983, it made extensive use of dealers of office equipment to reach also smaller customers and private persons, which became a necessity with the launch of EIS' PC in 1983.

6- *advertising and media strategy:* while LM never needed to develop any particular profile for the public opinion and the mass market, being its key "reputational" asset its close relationships customers, EIS needed instead a clear identity and profile towards its many customer. This was to be obtained by extensive use of advertising, PR and all medias.

Ericsson was more or less aware of most the above challenges even before the creation of EIS. In particular the need of a clear and unified profile was immediately recognised as a problem to be solved. Prior to 1982, the LM group addressed its customers with over 50 different names and logotypes, one for each of Ericsson's firms and divisions. Being in the computer industry and addressing a mass market could not be done from these premises. Therefore, in the very moment of the creation of EIS, in January 1982, it was also introduced a new logotype and a common visual identity (the one still used today) that extended to the whole Ericsson group. This logotype would later be applied by EIS to all the former Datasaab products in order to achieve this unity. Only bestsellers and strongly established products such as the Alfaskop terminals kept their original name, side-by-side with the EIS logotype. Not surprisingly, the first marketing move by EIS was to launch itself, rather than its products. This was done with an aggressive media campaign aiming at presenting the new company, with the slogan: "Ericsson Information Systems: We are ready when you are".

Also the selling and distribution challenge was perceived quite soon as relevant and the sales channels were arranged in order to cope with it since EIS' birth. Other challenges became instead evident only at a later stage, in 1983-84, such as the problems related to product development and production.

3.2 Enthusiasm and euphoria hide problems at EIS AB: 1982-83

Despite the challenges that the computer adventure represented for Ericsson, the first two years of EIS' life were filled with enthusiasm and almost euphoria. Håkan Ledin, from LM executive staff, was appointed CEO for EIS AB and chief for the whole BI-area in the Ericsson group. Most of the other executives from Datasaab AB were kept in place at the lead of their respective divisions. The first organizational layout for EIS included the following 4 divisions: *communication systems*, including all PBXs, MD 110, ERIMAIL (see Bladh & Wiberg, 1983) and the ERIPAX systems; *business systems*, including the two Linköping-based systems for businesses and banking; *Alfaskop terminals*; and *telecom terminals*, including ERITEX and normal telephones. Only for business systems and the Alfaskop terminals EIS had own production facilities and directly owned sales subsidiaries abroad, which had been inherited from Datasaab AB. For communication systems and terminals, EIS was instead totally dependent both for production and sales on the LM group.

Sales of EIS where expected to double from 2.2 billion, in 1982, to 4.4 billion, in 1987, i.e. an increase of 20% was forecast for each operating year. For the first two years, the key goals set by executives for EIS were: 1)to increase strongly sales volumes for all of its products; 2)to focus heavily on the conquest of the US market, considered the largest one for office

automation products; 3)to develop the "integrated office" concept around MD 110, ERITEX 10 and Alfaskop. No specific and explicit plan was instead developed in 1982 for integrating routines, operations and administration of the four original units that were merged in EIS: LM's "G" and "S" divisions and Datasaab's Linköping and Järfalla units. Ericsson's management seems to have been aware that this would have taken its time and would have created problems if accomplished to quickly: EIS was actually formed for over 70% by former Datasaab's staff. Moreover, no profit goal was explicitly set up for the first two operating years: there was only the vague idea to reach break-even in 1984. The belief was strong that by simply increasing sales by 20% each year and by slowly accomplishing the integration between the four original units, EIS would reach profits by 1984-85.

As expected, volumes increased in most areas during the first year, 1982. In particular, Alfaskop's sales were rocketing. Ericsson had explicitly invested over 40 million SEK in the very modern Järfalla factory producing Alfaskop terminals, bringing its capacity up to 50,000 units per year. Many large Alfaskop orders were collected by EIS in 1982-83 from both old and new customers: from LO (worth 20 million SEK), from Fellestadata A/S (3,000 terminals and worth 50 million SEK), from SAS Data (6,000 terminals and worth 150 million SEK), etc. During 1982 more than 25,000 Alfaskop terminals were sold and in April 1983 the unit number 100,000 was produced[7]. Also the other product areas showed improvements in 1982-83. When the new "series 2000" of business and banking systems (see Anglevik et al., 1983) was introduced in mid 1983, replacing the obsolete and unsuccessful series D16, sales improved considerably for EIS' Linköping division that had struggled with losses in 1982. Series 2000 for banking systems was ordered by SE-Banken (in a large deal worth 150 million SEK for deliveries in 1984-86) and two Spanish saving banks (for 85 million SEK). Important delivery contracts were signed also for MD 110 (with Volvo, Televerket and other state-owned telecom operators) and ERITEX 10 (e.g. with the Swedish Foreign Office). But, admittedly, deliveries of these state-of-the-art products, supposed to be at the core of EIS "integrated office" concept, were not scheduled to start until late 1983.

EIS was also establishing its position internationally in 1982-83: all former Datasaab AB's sales subsidiaries were taken over and re-organized inside the Ericsson group. EIS' products were sold in 26 countries by a total of 40 sales units, some of which were Datasaab sales offices while others were LM sales subsidiaries. A distinction between which products were sold by which subsidiaries was though still kept for the first years: communication systems and terminals (MD 110, ERITEX, ERIPAX, ERIMAIL and telephones) were still sold by LM subsidiaries, like before the creation of EIS; computer terminals (Alfaskop) and business systems were instead sold by the former Datasaab sales units. It would take until 1985 before co-ordination and integration in international sales subsidiaries could be achieved: this delayed the concrete possibility to sell EIS' whole product range via the very same sale unit and certainly did not help the promotion internationally of EIS' integrated office concept.

A look at the economic accounts for 1982 shows that EIS suffered a loss of around 100 million SEK over sales of 2.4 billion SEK, which corresponded to the budget for that year. Only Alfaskop was actually generating a tiny profit, while banking and business systems were selling but at a loss for their division. The sales increase had been, in fact, accomplished with high costs. Moreover, MD 110 was a nightmare in its first year of commercialisation:

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[7]Alfaskop's sales would stabilise then around 50,000 units per year until 1985, when the crisis in the computer industry hit also EIS. The success of Alfaskop terminals continued though also after Nokia Data AB took over this brand: in 1994, when Alfaskop was retired from the market, it had been produced in more than 900,000 units, since its birth in 1964.

recurrent technical flaws created a negative image towards key customers such as Volvo, where a pilot project took over 3 years to become a usable product. The focus on the US market was proving to be very expensive and did not give the hoped results in terms of sales because of too strong competition (US was the home market of a colossus of the likes of IBM) and the low recognition that Ericsson had on the IT sector there. A lot of money was being spent on advertising campaigns that did not give expected results for short-term sales. Technical integration of EIS' products was still a problem well into 1983: instead of having a common platform for an integrated office system, the so-called "ENA" (Ericsson Network Architecture), EIS had available just a mix of 4-5 different computer systems, only partly compatible: series 16 of minicomputers (later substituted with series 2000), Alfaskop, MD 110 and ERITEX-ERIMAIL-ERIPAX. Also the concrete realisation of the "integrated office" concept, i.e. outside EIS' R&D lab and at customers' locations, was suffering. Finally, the integration between the four original units had been languishing and conflicts more than co-operation between them could be expected.

3.3 Facit AB joins EIS towards new adventures: 1983-84

The problems presented in the last paragraph of section 3.2, were not perceived as particularly serious by EIS' management that was instead more confident than ever in the future of EIS and of the computer industry in 1983. This enthusiasm is visible in EIS and LM's next important strategic move: the acquisition of Facit AB, Sweden's largest producer of office automation products ranging from typewriters to calculators and from computer screens to furniture. The lack of integration and co-ordination inside EIS in 1982-83 was thus not considered as a problem when this new unit was to be integrated into EIS and LM's BI-area.

Negotiations for the acquisition of Facit AB were started in September 1982 between LM Ericsson and the owner, Electrolux AB that had rescued Facit from a crisis related to the electronics revolution in the early 1970s and had brought it back to profitability in 1977. Now Electrolux was ready to sell Facit because it did not belong to its core business of home appliances. On January 1st 1983 Facit AB became officially part of the LM group. Facit AB employed by that date 4,300 persons (2,500 in Sweden and 1,800 abroad) and had a turnover of 1.3 billion SEK, generated by four product divisions: *office automation* (typewriters and minicomputers), *office furniture*, *data products* (printers and other peripherals, sold often to OEMs) and *calculators*. All these products were produced by Facit's own factories in Åtvidaberg, in Blekinge, in India and in Brazil. The main reasons behind the Facit deal were the possibility to complete EIS' range with some interesting complementary products for the "integrated office" concept and the access to mass markets that Facit's impressive distribution network could provide. Facit had, in fact, a large retail organization in Sweden, Scandinavia and in the whole world. Facit had own sales subsidiaries in 15 counties and sales agents in 110 countries: all in all, Facit's products were distributed in over 6,000 points of sales around the world. But also Facit's technical competence in office automation technology was highly regarded by Ericsson, who had co-operated with Facit also on the big ERITEX 10 project (see section 2.1).

The entrance of Facit AB in the BI-area would imply, apart from organizational problems, further challenges for the integration of an even more heterogeneous product and solution range and for the advent also of a new form of distribution via agents and dealers. But all these problems were momentarily put aside by EIS's next big commercial move: the launch of Ericsson's own PC, "Step/One", presented at the Sollentuna exhibition in April 1983. This was the first "stand alone" piece of equipment directed to a large market that EIS had ever

developed. "Step/One" was sold though still by an especially recruited direct sales force that visited personally all potential customers ranging from small firms to larger corporations. "Step/One" had been developed having IBM and DEC's PCs as a benchmark and with the aim of becoming the market leader in Sweden and to conquer significant market shares abroad. The first responses from customers to "Step/One" were positive in Sweden and EIS continued developing the PC idea and launched in August 1984 the first Ericsson PC addressing the consumer market, considering also its reasonable (for those days) price of 40,000 SEK. The EIS' PC line would be completed in early 1985 with the launch also of EPPC, Ericsson's portable PC. But sales volumes for Ericsson PCs never reached the expectations of EIS' management, who aimed at 10-15% of the European market and at selling at leas 100,000 PCs per year. For 1984 sales where only around 30,000 units and 1985 would be the year of the big crisis for the world's computer industry.

The acquisition of Facit AB made necessary a re-organization of EIS, its divisions and productions plants. In July 1983 EIS was restructured around 5 divisions: *communication systems* (MD 110, other PBXs, ERIPAX and ERIMAIL), *business systems* (series 2000 for banking and administration), *workstations* (Alfaskop, "Step/One" and PCs, typewriters and other terminals), *office equipment* (calculators, telephones and dealer support) and *service & sales support* (hardware and software service, customer training and spare parts). Facit's *office furniture* and *data product* divisions were though not integrated into EIS AB and remained separate companies. This arrangement was considered appropriate because the data product division, producing peripherals (printers, monitors etc.), had its major customers among other OEMs. These placed regularly large orders, such as Memorex' 600 million SEK order for printers in 1984, but some of them, like IBM, were competitors to EIS.

The compounded EIS/Facit venture had achieved a considerable mass. Purchased goods in 1983 amounted to 1.4 billion SEK, of which 400 million SEK went to mechanics supplies and subcontractors, 300 million SEK to electrics and electronics suppliers and 200 million SEK to purchases of peripherals of various types. EIS had moreover over 1,000 suppliers, from which it purchased 50,000 different components. 1983 was a positive year in terms of economic results and especially sales for EIS/Facit and the whole BI-area at LM: break-even had been substantially reached and sales had rocketed at almost 4 billion SEK (also as a result of the acquisition). Despite these favourable results, Håkan Ledin left in September the position of CEO for EIS AB and was moved to the US to lead Ericsson's efforts there. Indeed, it seems like some clouds were starting to materialise on EIS' sky:
1- results from the US investments done by EIS were too disappointing and it was necessary to re-organize immediately EIS' activities there.
2- the favourable sales development had not been followed by appropriate measures to sustain operations in production and deliveries: as a consequence, shipment to customers of almost all EIS products were heavily delayed from the second half of 1983.
3- most of EIS products were infected with serious quality problems, often caused by inadequate production routines. *These two issues would cause EIS a tremendous loss in terms of reputation towards customers, for the years to come*.
4- costs had not been kept under control during 1982 and 1983, so that EIS/Facit risked being caught in a bad position of high costs, low quality and bad customer service if sales had ever to stop increasing with the same high rate (which was exactly what would happen in 1985).
5- EIS/Facit had a too heterogeneous product range with many solutions that had nothing to do with each other or that were even in conflict with each other. For instance, the terminal ERITEX appeared a duplication of Alfaskop and the PC terminals. No wonder that ERITEX

(a multi-million R&D project) was later abandoned, after Alfaskop had definitely won an "internal" sale war and PC terminals were selected as the real thing to bet on.

In order to solve its problems in the US, EIS signed deals with large local firms for the distribution of its products: with Honeywell, EIS created a 500 million SEK joint venture for developing and marketing MD 110, ERIPAX and ERIMAIL; with Sperry, EIS signed a contract for worldwide distribution of the banking system series 2000. The other EIS products (and especially Ericsson's PC) were instead totally neglected by the American market. As for the other 4 problem areas, the newly appointed CEO Stig Larsson tackled these problems by launching a series of internal projects to improve delivery precision and product quality and to reduce costs in all possible areas. Moreover a first re-organization was introduced in 1984, according to which all previously separated units in the BI-area were now integrated under EIS AB, in order to allow the CEO direct control over each unit. EIS included thus 4 sectors, including many of the previous "product divisions": the *business systems sector* (banking systems, administrative systems and time systems by Ericsson Telemateriel AB), the *communication systems sector* (large systems by Telemateriel and local networks, included in the previous communication systems division), the *workstations sector* (Alfaskop, PCs, typewriters and advanced workstations, recently launched in co-operation with the American Sun Microsystems) and the *office equipment sector* (furniture, calculators, telephones and the OEM-oriented peripheral business).

3.5 The epilogue, unsolved and unsolvable problems: 1985-87

1984 was concluded with positive news from the sales side: in Sweden volumes had increased by as much as 40%. Most product divisions displayed sales improvements: especially the OEM business, the Alfaskop series (soon to approach its 200,000th item sold since 1964) and the banking system serie 2000 (for a which a huge order for 500 million SEK was obtained from the Swedish SparBankerna). Even the problem child, MD 110, was obtaining great sales successes on all markets: after 8 years of false starts, hundreds of thousands of lines were installed. Finally, a renewed enthusiasm was provided by the "Ericsson City" initiative, started in late 1984: EIS created a new and unified brand and look for all 70 Swedish retailers that once had been Facit dealers and that now would offer the whole range of EIS products and services under one single roof. All in all the BI-area, integrated under EIS, reached a turnover in 1994 of 7 billion SEK, which represented a third of the whole LM group. But profitability problems, because of low operations efficiency and high costs were still there for EIS, ready to make their presence felt as soon as sales should turn sour. This is precisely what happened in 1985, when a big crisis hit the computer industry worldwide, after the highly expansive last 10 years.

From July 1985, it became evident that all computer producers, including EIS, had to disinvest, cut heavily on costs and personnel in order to survive the slump: this can be seen as the beginning of the end for EIS. EIS strategy for the year to come was completely changed in the hope to rescue the venture:
1- EIS abandoned the idea to alone develop and sell totally integrated and complete office solutions and decided instead to focus on those products it was best at and could sell with a profit.
2- EIS abandoned the idea to conquer the US market (where too much money had been spent with poor results) and decided instead to focus on European large and medium accounts.

3- EIS realised that it needed extensive co-operation with other large data and IT companies to create together viable integrated solutions, especially in the respect of common industry standards to achieve product compatibility.

In organizational terms, EIS proceeded with a further re-organization of its whole business area (BI) in late 1985. The sectors were reduced to three: *communication systems* (MD 110 and the other PBXs, ERIPAX, modems and telephones), *data systems* (Alfaskop, PCs, administrative and banking systems of the series 2000, advanced workstations and time & security systems) and *office equipment* (typewriters, furniture, calculators and the OEM-oriented peripherals). The three sectors' chiefs had also direct control over own production plants and the marketing and sales functions, in order to keep costs throughout the value chain under control. It can be noticed, incidentally, that the three new sectors correspond exactly with the business areas of, respectively, the former "G" and "S" divisions of LM, Datasaab AB and Facit AB, as they were before the acquisitions in 1981 and 1982. From an organizational point of view it seems like EIS has completed a circle, where many different combinations and re-combinations have been tried without success. Bringing back each product to the original organizational structure can also be seen as a preparation for a more radical type of transformation. This is exactly what LM executives had started to think about: to dismantle the whole EIS and BI-area and return to the status quo before the acquisition of Datasaab AB in 1981. Profitability would turn into a mere mirage for the years to come at EIS, since sales never recovered from the 1985 slide. Many Ericsson PCs were still unsold, while the market, when it recovered started to ask for completely new and more advanced models: Ericsson executives eventually decided not to take part to this race.

In 1987, Ericsson started "secret" negotiations with Nokia Data AB (in which LM group was though a minority shareholder) in order to sell most of the computer business of EIS AB. The deal was made official the year after. In December 1987, the Facit furniture business was sold to the Norwegian furnishing firm Design Funktion A/S. The communication system sector (with the same products listed in the previous paragraph) was instead kept inside the LM group and re-organized into a new business area called "Business Communications" (EBC or BB) in 1988. EBC enjoyed strong growth and rapidly reached profitability in 1989 (over 100 million SEK over sales of 5.1 billion SEK) and is still today an important business area for the LM group.

4. Unrealised technical convergence or mismatch technology-needs?

This section analyses Ericsson's adventure in the computer industry, in search of potential explanations for its failure[8]. Many reasons can be pointed at, but this analysis focuses on those related to *technology* and *business strategy* and is indirectly inspired by the business network view on these issues (Håkansson & Snehota, 1995). Four reasons are presented here: the first two deal with the supply and technology side of EIS business, while the third and fourth deal with the demand side and customer needs.

The *first reason* lies in how *technological solutions* (computers and telecom equipment) and *applications areas* (computing, information management and communication) interplayed in the period in which EIS tried to establish itself in the IT industry. The vision of the

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[8]The explanations for EIS' failures provided here do not imply though that EIS would have become successful simply by acting differently, for instance according to the routes implied in each of the suggested reasons.

convergence computer-telecom did not really materialise during the 1980s, and certainly not in the "restricted" office space or in the solutions suggested by Ericsson. The computer and IT industry in the 1980s developed in a completely different way: instead of increased integration of solutions, provided by a sole supplier able to master all the varying range of technologies and products necessary for the "office of the future", the industry moved towards increased specialisation. Firms specialised (and became leaders) in either the software or the hardware business. Very few among those who bet on both were successful in the long run. Also for software and hardware, further specialisation emerged, with actors specialising and leading specific application niches. For software, specialisation occurred and occurs along such product lines as databases (Oracle), application software (Microsoft), operative systems (Microsoft or Linux), administrative application packages (SAP or Siebel) etc.; while, for hardware, along such lines as mainframes (IBM), minicomputers (Digital Equipment), workstations, PCs, laptops, modems, routers (Cisco) etc. No single actor could manage to get a grip and be a significant player in more than a couple of these product-technology segments, considering also the growing importance of the "service element", increasingly required by customers purchasing complex IT solutions with all a series of related services. This happened despite the apparently obvious and strong technological connections and dependencies existing between all the aforementioned technical components in the IT sector.

The convergence computer-telecom that pushed Ericsson into the IT business was to happen more than a decade after the 1980s, but not certainly or solely inside the office environment. It came in the 1990s thanks to the Internet and extended to whole public telecommunication networks (see Johnsson, 2001). This vision will become reality with 3G systems, expected to enter in use in 2003 (Meurling & Jeans, 2001: 407 s), with Ericsson as an active player. Many projects in the fields of data communication and mobile data transmission are still going on (such as the promising Bluetooth consortium or the less successful Ericsson-Microsoft joint venture). But the convergence that happened in the 1990s did not allow a single player to control alone and unilaterally the areas brought together, the computer and telecom equipment.

The *second reason* regards EIS' ambition to dominate all technology applications in office automation. EIS' product line was very heterogeneous but its executives believed in the vision on integrated office solutions provided by a sole vendor. But one may wonder about the viability at all of EIS "integrated office solutions" strategy from the very beginning. Probably, back in 1981-82, these three questions were not asked, or were not considered relevant:
1- How will the single EIS' products for the integrated system work together with the others?
2- Will each single part of the EIS' integrated solution be the best of its breed? If not, customers will be tempted to discard it for the best one available and look instead for someone who can combine and integrate a mix of best solutions.
3- Will customers accept the integrated solution as packaged for them by EIS? or will they pick each part of their information systems from different vendors? or will they attribute to somebody else than EIS the specialist role to choose the best solutions to be integrated?
EIS became though aware of these issues, but probably a bit too late: it is only in 1987 that we can read that EIS "… recognises that all (its) products must co-exist with products including software packages from other vendors" (Elfgren & Fernius, 1987: 60).

Quite interestingly, Ericsson did not recognise immediately the importance of these three questions, despite its experience in its main business (developing, selling and installing telecom equipment). Ericsson had for ages supplied telephone networks in combination almost always with component and sub-systems supplied by other, often competing, vendors.

Ericsson owes certainly its success to a handful of key components or sub-systems, such as the mythical crossbar switches of the 1950s or the AXEs of the 1970s, but Ericsson could not possibly be best in all the many parts and sub-systems of an integrated and complex system as a telephone network. Specialisation in the telecom business had already gone a long way when Ericsson entered the computer industry in the 1980s. Specialisation led for instance Ericsson to consider telephone terminals as a much less important element of its business, on the verge of becoming commoditised and usually bought by operators with combined deliveries from many different suppliers. Also tele-cables had become a non-central part of each customer order, with some LM customers purchasing cables for an Ericsson project from other suppliers. But still, a specific product or systems (crossbar switches or AXEs) were the key ingredient for the success of Ericsson's telecom business, which did not oblige LM to produce and be at the leading hedge for each single component and subsystem. This was a pattern that had emerged after decades of presence and experience in the telecom business. Looking at LM's traditional business would have thus warned EIS against trying to master the computer business as a whole and trying to be best in all. But, in the early 1980s, it was certainly not as obvious as today that this could be a similarly right recipe for the new computer business.

EIS had instead the ambition to fully control a "localised" computer-telecom convergence in the office environment (Ramqvist & Thorén, 1981) by means of fully integrated and complete office solutions (see section 2.1 and 3.1 for a complete list of them). Some specific products epitomised this dream of convergence: such as the hybrid computer-telex terminal ERITEX 10 (see section 2.1). This appears clearly an impossible dream, with the hint of what happened later in the computer and software business in the 1980s and 1990s. But the idea of an integrated office completely provided by EIS as a sole supplier must have sounded fascinating and even "elegant": each of the aforementioned artefacts played a well defined role in Ericsson's view and had only to be plugged into each other to create a marvellous integrated solutions covering all information and communication needs. A part from technology and supply side-related issues, this idea became practically impossible to realise for a *third reason*, related to customers and their needs. This third major obstacle on which Ericsson's idea stumbled was the *impossibility to find users who really needed EIS fully integrated and complete solutions* and were ready to buy the whole package.

Not a single customer actually purchased this type of complete integrated solutions from EIS. This should have included all the following products: a top-of-the-range digital PBX MD 110 and many connected telephone terminals, a Series 2000 business system for administration, inventory control, production planning and invoicing, a wealth of Alfaskop terminals or of Ericsson PCs (either "Step/One", EPPC or Facit's DTC), ERITEX terminals, an ERIMAIL and ERIPAX data communication systems, Facit furniture and peripherals (printers etc.). No such a customer was ever found for a series of reasons: first of all, it would have been necessary to find a large customer ready to invest from scratch in a completely new office automation system, including each single piece of it. Most potential customers had already installed solutions bought from other suppliers for each of the office automation tasks that EIS aimed at covering. These solutions had in many cases been recently purchased and could not be replaced by EIS' own when other EIS systems were installed. Secondly, many customers were reluctant to become dependent on a sole supplier for the whole solution for office automation and information management, which counterbalanced the potential benefits of having perfectly integrated solutions. Suppliers themselves had instead to guarantee integration between the various components in a customer's IT architecture by having fully compatible solutions: industry standards and protocols played a major role for this purpose,

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with IBM earlier, and Microsoft later, imposing the de facto industry standards to which all other players, including EIS, had to adapt. EIS' dream to ride the office automation wave was thus to be torn apart by dynamics partly outside its control, despite its technological basis and efforts to convince customers.

The *fourth reason* for EIS failure are the missing connections to the expected users for its "integrated office solutions" in the important phases of product development. Market and customer orientation problems can be summarised in these terms:

1- Organizations and offices are customers with greatly varying and unstable needs for particular functional, technical and even aesthetic solutions, compared to the more homogeneous needs of telecom operators seeking technically appropriate solutions for their telephone networks. Confronted with much more varying and unstable customer needs, EIS followed instead the traditional technology-driven way to develop products and solutions. This created an implicit mismatch with what EIS' customers needed.

2- EIS had no close relationship to a specific customer for developing its office automation solutions. Whereas large mainframes and traffic control system were developed by Ericsson in close cooperation with a key customer like the Swedish military, when EIS entered the arena for "integrated office solutions" it had no engaged customers intervening in the construction, design and development and testing of these new products. EIS applied a strong "engineering push" to define both the technical solution and shape the concrete artefact, instead of interactive development, with the involvement of active customer manifesting real needs and coming up with suggestions.

The second issue above is particularly important if put in a historical perspective for Ericsson as a whole: each of LM's great successes in the telecom business (the crossbar switch, the AXE switch, GSM equipment etc.) had been and would come to be nurtured in close cooperation with at least one key telecom customers, especially Televerket (and later Telia). These close connections have proved fundamental for Ericsson in terms both of functional and technical development and of reference marketing. This sort of "incubator" lacked for almost all EIS' products[9]. The difficulty was even increased by the completely new type of customers and customer needs to which EIS' products and visionary integrated solutions were addressed: a new world with completely different rules than the ones LM was used to. Against this background, the vigorous marketing focus directed towards the US market from the very beginning of the EIS adventure, almost neglecting the necessary test period in the secured haven of LM's home country, could certainly not improve EIS products' faith.

5. EIS: just a parenthesis in Ericsson's history or something more?

The epilogue of the EIS adventure presented in section 3.3 may seem to confine EIS just to a bad investment of which Ericsson quickly wanted to get rid. This conclusion seems logical if one limits the analyses to the hard balance sheet figures and the losses cumulated by EIS. Also the general attempt to forget and move on and to re-focus on the Ericsson's "core business", i.e. telecommunications, may present EIS just as an unfortunate parenthesis in Ericsson's long history. After all, the PBX and communication systems were re-integrated in the LM group and proceeded on their own path towards profitability. On the other hand, it appears unfair to claim that the experience offered by the EIS adventure did not change

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[9]The only exception is probably the PBX MD 110, which was developed in close interaction with key customers that tested it under an 8 years period until it actually became a sales success. This also led Ericsson to keep this product even after dismantling EIS.

Ericsson forever. After all, EIS and the connected BI-area covered, in the period of its maximum expansion in early 1985, almost a third of Ericsson's whole empire.

A more balanced historical interpretation of EIS points at many important elements that would strongly affect, also positively, Ericsson as a whole. Contacts were made, for the first time, with a new group of customers (private organizations) that would become increasingly important for Ericsson, especially for its "Business Communications" (EBC) division. EIS allowed also the acquisition of advanced competence in electronics, computing and software development that would become fundamental to face the new challenges of the digital mobile networks in the 1990s. The experience gained in the field of data communication would be pivotal when the Internet became a central part for telecommunication networks in the late 1990s. Ericsson gained also, via EIS, a competence in logistics, production operations and development of "stand alone" terminals with short lifecycles that would become vital to compete in the business of mobile telephones, where Ericsson, at least until the late 1990s, earned important money. EIS also implied making the first experiences in consumer advertising, which can also be considered as valuable for mobile telephones.

Also Ericsson's identity would be changed once and for all by the EIS adventure. Recognition among private consumers, that until the Ericsson PC had almost never heard talking of Ericsson, increased dramatically during the EIS years. From having being for almost hundred years a heavy mechanic engineering-oriented group, EIS laid the ground for Ericsson's new identity as a modern electronics conglomerate, which would be more suitable to compete in the mobile networks and terminals wars of the 1990s. EIS was moreover one of many manifestations of Ericsson's endeavour towards modernity and to being on the leading edge. Even if it cannot be justified in the eye of corporate finance, since its poor economic results strongly condemn it, the EIS adventure can be re-evaluated in the light of Ericsson's history and long-term strategic development.

The EIS adventure was, in fact, a clear manifestation of Ericsson's love for IT and the effort to be at the forefront in all technological development related, directly or indirectly, to its core business. In the meantime EIS also changed the whole LM group's identity in a historical perspective. But of course, such an adventure is surrounded by a bad light because of the large amount of money lost in the project and the feeling of "failure" that the withdrawal from the computer industry implied. The unfortunate outcomes of EIS venture did not mean though the disappearance of Ericsson's interest for the data and IT fields: the whole development in mobile telecommunication of the 1990s and, especially, the further steps to be expected in the 2000s witness that computers and telephone systems have grown into integrated solutions, even though not in the way envisaged by EIS managers. Today, *maybe also thanks to EIS*, Ericsson can be a central player in this arena.

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