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The history of the Swedish ATM - Sparfrämjandet and Metior

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Abstract. In this paper we describe the first decades of the history of the Swedish ATM (Automated teller machine). Sweden was one of the pioneers in using ATMs, starting with cash dispensers or cash machines in 1967. The first machine was made operational and shown to the press on July 6, 1967, in Uppsala at Upsala Sparbank, only one week after the first cash machine in the world was made operational in the UK. The Swedish machine was manufactured by the Malmö based company Metior. This paper seeks to document the origins and early development of cash machines by Swedish savings banks, employing oral as well as archival sources. Interestingly, we find that the key actor behind the ATM technology was not the saving banks' computer company Spadab, but Sparfrämjandet, a company most known for its campaigns to encourage thrift among children.

Keywords: cash dispensers, automated teller machines (ATM), technological change, savings banks, Sweden.

1 Introduction

Automated teller machines (ATMs) has been around for some 40 years and today we can use the same card to withdraw cash all over the world. In this paper we describe the first decades of the history of the Swedish ATM. Sweden was one of the pioneers in using ATMs, starting with cash dispensers or cash machines in 1967. The first machine was made operational and shown to the press on July 6, 1967, in Uppsala at Upsala Sparbank, only one week after the first cash machine in the world was made operational in the UK. The Swedish machine was manufactured by the Malmö based company Metior. This paper seeks to document the origins and early development of cash machines in Sweden, employing oral as well as archival sources. Interestingly, we find that the key actor behind the ATM technology was not the saving banks' computer company Spadab, but Sparfrämjandet, a company most known for its campaigns to encourage thrift among children. This finding is, however, not as

surprising as it may seem since Sparfrämjandet also had the task to rationalize administrative functions among the savings banks. The ATM technology was not a coincidental innovation made by technicians, it should rather be seen as a part of a modernization process in the savings banks movement that took place in the light of intensified competition and rising transaction costs.

The reminder of this paper proceeds as follows: the next section provides some background regarding the origins and growth of savings banks in Sweden. The third section documents the adoption of cash machines by Swedish savings banks and how this development was intertwined with the history of the engineering firm Metior (later to be Asea-Metior). The fourth and final section encompasses our conclusions.

2 The Swedish savings banks – a brief overview

During the first half of the twentieth century competition between savings banks and commercial banks in Sweden was rather weak. Each had different customers and offered different services. In some instances they even came together to collaborate in joint projects. Whereas the commercial banks had experienced serious problems during the inter-war period, savings banks flourished while operating mainly in local and regional markets. Although their number had already started a downtrend (approaching 450 in 1945 and as little as 60 in 2008), jointly their share of total deposits increased from 26 to 43 percent between 1920 and 1950 and profits were high [1].

The decades that followed the end of World War II were characterized by overall economic growth, increased affluence and expansion of the welfare state in Sweden. This era also saw increased competition in the banking sector as the commercial banks began to widen their customer base (while aiming to attract all sorts of new customers, from companies to wage-earners). Handelsbanken, for example, launched itself as the ‘people’s bank’ in 1950. Shortly after it and other commercial banks used the contacts developed while financing the working capital of manufacturing companies to offer these companies direct payroll deposit services.

The savings banks were initially hesitating to this new service but there was a group of younger managers that pushed for a more aggressive corporate strategy [1] and [2]. Throughout the 1950s these young managers were under the leadership of Sven G Svensson, director of Sparfrämjandet, who also organised annual conferences in Saltsjöbaden to facilitate the meeting of like-minded young managers [1]. They were united by the idea that the savings banks had to adjust to ongoing social change. Furthermore, they had the conviction that the savings banks should meet the challenge of Handelsbanken and other commercial banks but not by demanding protection from the state but by introducing better services. Many ideas that came out of the conferences at Saltsjöbaden were implemented during the 1960s as the attendants reached influential positions within the savings banks. As a result the Swedish savings banks evolved from small-scale savings institutions to ‘modern’ business-oriented banks. During this process the emphasis on thrift was downplayed while the savings banks began to view depositors more like customers than savers.

Rocketing administrative costs provided a strong incentive for the savings banks to seek greater labour efficiency through the application of new technologies. As suggested by Table 1, the increase in the nominal value of deposits was accompanied by an increase in the value of administrative costs (measured as a percent of total deposits). It is around this background that they intensified efforts to introduce mainframe computers for various tasks during the 1960s.

Table 1. Administration costs in the 80 biggest Swedish savings banks, 1962-1967. Source: [2]

Year	Million SEK	% of deposits
1962	114	0.847
1963	128	0.895
1964	150	0.963
1965	176	1.063
1966	213	1.124
1967	257	1.194

As mentioned, the savings banks were late to respond to the direct payment of payroll service offered by commercial banks. This was to change in 1960 when most of the bigger savings bank introduced that service. But unfortunately the number of individual accounts they managed to attract proved to be much lower than expected. This became evident two years later in 1962, when the commercial banks had more than twice as many accounts as the savings banks (respectively 387,000 against 143,000). However, close links with trade unions helped the savings banks to transform their position and eventually dominate the direct payroll payment service. By the end of 1970 the savings banks had no less 870,000 accounts [3] and [1]. Table 2 below illustrates how the growth in business volume was accompanied with an increase in staff in Sweden.

Table 2. Estimated number of employees and deposits in Swedish savings banks, 1962-1967. Source: [2]

Year	Number of employees	Increase in %	Deposits million SEK	Increase in %
1962	3,500		17,699	
1963	4,100	17	18,957	7
1964	4,700	15	20,531	8
1965	5,200	11	22,263	8
1966	5,800	12	24,511	10
1967	6,400	10	27,259	11

While increased involvement in direct deposit of payroll reduced the number of cheques passing through the banking system, the savings banks found this involvement was not without costs. In order to keep up with the commercial banks, the savings banks had to expand their workforce. This resulted in payroll and related costs growing faster than the pace at which the value of total deposits increased. Consequently, administration costs bolted. Expressed as a share of deposits, administration costs increased by 40 percent between 1962 and 1967. Table 3 below

summarises a closer study of the four largest savings banks. It revealed that the number of transactions (withdrawals and deposits) increased by 125 percent, whereas their total funds increased by 64 percent [2].

Table 3. Transaction volume and deposits in four biggest Swedish savings banks, 1962-1967. Source: [2]

Year	Number of deposits and withdrawals	Value of deposits in million SEK
1962	2,011,600	989
1963	3,077,600	1,062
1964	3,528,900	1,147
1965	3,843,300	1,246
1966	4,473,000	1,425
1967	4,526,700	1,626

Another aspect of the modernization of the Swedish savings banks that took place in the 1960 was concentration. In the beginning of the 1960 there were still over 400 individual savings banks in Sweden. As a result of amalgamation between small units operating in the countryside and city-based ones, only 273 savings banks remained in 1970. The concentration process went on in the following decades with merges between the biggest banks. By 1989 there were 109 savings banks left, but this population consisted of 20 big banks with regional coverage that had 80 percent of total deposits and 95 local banks [1].

Rising administrative costs and an increasing number of accounts in the late 1950s and the 1960s required Swedish savings banks to take urgent action. A major step towards computerization was taken in 1958 when a Technical Committee was formed within the Swedish savings banks association. Per Olov Rimvall, a member of the committee, was a driving force behind research to solve the 'bookkeeping problem' in the savings banks and eventually initiated the formation of commonly owned computer and data processing company in 1961, which later was to be called Spadab. However, to all appearances Spadab did not play a central role in the development of cash machines. Within the saving banks movement, the agent of change were found in another organization, namely Sparfrämjandet.

3 Sparfrämjandet and Metior

3.1 Sparfrämjandet

Sparfrämjandet was originally the propaganda department of the Swedish savings banks association. According to Hessling [3], this department had three main aims: first, it was to encourage thrift, both internally within the savings banks and externally among the public. Second, it was to serve as a publishing house and, third, as a central purchasing unit to coordinate purchases of material that the savings bank needed in

their retail branches. The department regularly published printed material and was responsible for launching national campaigns. In 1941 the propaganda department was re-named Sparfrämjandet and in 1943 it became an independent company. One reason behind the change of name was the negative connotation of the term 'propaganda'. The new Sparfrämjandet had three departments namely, publishing, external relations and central purchasing.

Sparfrämjandet was the initial driving force for savings banks to adopt cash dispensers because the central purchasing department of Sparfrämjandet had a parallel development within automation: in 1960, Hans Rausing and the Rausing company started to develop and sell coin sorting machines to the savings banks. This later became the firm Restello, a company within the Tetra Pak group.

The saving banks and Sparfrämjandet had for some years been discussing the possibilities of automating cash dispensing to rationalize handling of cash for bank tellers in the bank offices. One other need was to make it possible to distribute cash when the bank offices were closed, especially and as had been the case in Britain, after the banks closed retail branches on Saturdays in 196X.

3.2 The Metior cash dispenser

Sparfrämjandet wanted some type of machine or automat that was able to dispense bank notes and discussed the issue with Metior, a company in the Tetra-Pak group that manufactured automatic petrol pumps and had taken over production of the Restello coin sorting machines. The discussions went on for some time but the co-operation was not fully successful. Metior then contacted the commercial bank Svenska Handelsbanken who became the new partner in the development of a cash dispenser [5] and [2]. According to Körberg [2], Bengt Wetterholm, the CEO of Spadab at that time, reinitiated the contacts with Metior when learning about the interest of Svenska Handelsbanken [6] and [2].

Here it is worth noting that there are very few references to Spadab in Metior's archives. It seems like the company mainly had contacts with Sparfrämjandet and that it was this organization that influenced the design of the first generations of cash dispensers in Sweden. For example, when Metior in December 1966 was about to demonstrate its first machine it invited a representative from Sparfrämjandet but none from Spadab.

The initial demonstration was planned for 11 January 1967 in Malmö. There were also plans to start testing the machines in Uppsala in January or February the same year. Whether the demonstration and subsequent tests actually took place according to plans is unclear but it can be established that the first Swedish cash machine was made operational and shown to the press on 6 July 1967 in Uppsala. This was only nine days after the first British cash machine was operational by Barclays Bank and De La Rue, and a couple of days before Svenska Handelsbanken showed their first Metior machine.

After some months of testing, the general public could start to use the cash dispenser in Uppsala 24 hours a day in September 1967. The first machine had some problems and it took some time to get them sorted and have the machine operational most of the time.

In early 1968 Metior had manufactured five machines. Metior still called them prototypes and of these five machines, the savings banks had two and the commercial banks three. In the spring of 1968, mass production began as a result of Sparfrämjandet ordering 20 machines. This order included a number of specific requirements, indicating that the savings banks actively contributed to shape the new technology.

Some 20 machines were also delivered to Switzerland and one to the Netherlands. Each machine sold at 58,000 to 59,000 SEK. About a year later, in April 1969, the Swedish savings banks ordered Metior cash dispensers for 1.8 million SEK, Metior's biggest order so far. By February 1970, Metior had delivered 37 cash dispensers for the Swedish market, of which 24 had been bought by savings banks. At the same time, Metior had exported 141 cash dispensers. For instance, Metior had achieved a dominating position in Switzerland, where De La Rue had left the market, and was about to enter the French market in collaboration with Transac, a division of Compagnie Industrielle des Telecommunications (CIT).

The first cash dispenser went under the name 'utbetalningsautomat' and later 'Bankomat'. However this name was soon acquired by Svenska Handelsbanken and the commercial banks as the brand name for their dispensers. During its initial years Metior developed four generations of cash dispensers. The first generation was not sold commercially. The second and third were developed for the savings banks and the fourth was designed for the commercial banks and the French market.

Bankomat Mark 2 and 3 were made of steel and had punched holes for identification, while in the UK Chubb's plastic card had punched holes, Barclay-De La Rue used a cheque-sized voucher with a magnetic stripe and Speytec-Burroughs' plastic card had a magnetic stripe on the back [7]. Bankomat Mark 4 used a card with information embedded in a magnetic stripe that had been developed by the French Société General de Automation. To withdraw money from the Metior machines a PIN-code was used together with the card.

Whereas UK banks had been adamant not to deploy machines until their security had been tested [7], some years after the first Swedish machines were being used the security of the system became an issue. Withdrawals using fake cards started to appear. Someone had discovered the algorithm used to associate card numbers with the PIN-code. One Easter holiday someone travelled around Sweden, withdrawing money from each machine they visited. This led Metior to contact Bofors to help with the security issues. The co-operation led to Bofors buying 80 percent of Metior's shares on 31 August 1969. However, Bofors' interest and competence on these security issues regarding cash dispenser were insufficient. New problems, of such magnitude that the savings banks considered to close down its whole fleet of Metior machines, were reported in October 1971. As a result Bofors sold control of Metior to ASEA in 197X.

Interesting to note is that the Easter holiday incident led to a change in the internal regulations of the savings banks. Before the incident the retail branch that had the dispensers was solely responsible for losses that might arise. This was changed after the incident so that all savings banks collectively shared any losses from resulting from the malfunction of cash machines.

Already at an early stage, in August 1968, Metior delivered the first machine to be connected on-line to the Malmö computer centre. The second to fourth generations of

Bankomats were all possible to connect on-line via modem and Mark 4 also to a call system. However, most cash machines at the savings banks operated as stand alone, off-line machines.

A turning point came in 1971 as a result of two developments. First commercial banks within the Swedish Bankers Association, the post office and the Federation of Swedish Rural Credit Societies set up the Automatic Cash Dispenser Center. The aim of this independent company was to install and run cash dispensing equipment for the consortia, determine where the machines would be located, market its services (under the Bankomat brand) and administer card registration, data processing, clearing and statistical information. In November 1972, 15 Asea-Metior cash machines were made operational for the consortia in Stockholm. In 1973, 13 machines were deployed in Gothenburg and one more in Stockholm. The following year 10 more dispensers became operational in Stockholm. By 1974, the savings banks remained outside of the consortia which, at the same time, aimed to deploy a total of 100 machines throughout Sweden to service 1.8 million direct payroll deposit accounts. Between November 1972 and January 1974, banks in the Automatic Cash Dispenser Center consortia issued 29, 443 cash machine cards and dispensed some Skr 66 million (US\$ 14.54 million), with an average withdrawal equal to SKr 268 (US\$59).

A second important development took place when the new director of Spadab, Jan Rydh, attended the Automated Teller Machine Conference in Chicago in 1971. Rydh reminisced that during discussions dwelling on investments in off-line dispensers on the fringes of the conference, out of impulse he made the sudden decision to regard investments in off-line machines a sunk (i.e. irrecoverable) cost [8]. The decision was communicated to colleagues attending the conference and upon their return to Sweden, engineers at Spadab were free to start what became the Minuten project. The aim of this project was the adoption of on-line cash dispensers by the savings banks. In searching for potential suppliers contacts were made with a number of manufacturers of cash dispensers and in the end three companies competed for the project. These were the Swedish company Asea-Metior, the British company Chubb and the US-based Docutel. As a result of the deliberations, the savings banks finally abandoned Metior in 1975 by choosing Docutel as their suppliers of ATM devices (that is, on-line cash machines).

There are several competing explanations behind the move by the savings banks to abandon Metior. But one major factor was the weak US dollar at that time which made the Asea-Metior dispenser more costly than the Docutel machine [8]. Installation and service in Sweden was to be handled by Datasaab. This engineering company was at the start of their collaboration with Leif Lundblad and his Stockholm-based Inter Innovation company. Lundblad had developed its own cash dispensing mechanism to accommodate the differences between dollar notes and European currencies. The experience Datasaab had of the Docutel machines combined with Lundblads dispensing mechanism led to decision to develop a Datasaab ATM. However, before a working machine had been presented Datasaab became a part of Ericsson Information Systems. A number of machines were produced and installed in a number of countries.

The savings banks were the first to use this new generation of ATMs. These ATMs were initially known as mini-banks and 'Minuten' and the first machine was installed on May 24, 1977 in the city of Falun. In total, 600 Docutel machines were installed

[5]. All Minuten machines were from the beginning connected OLRT. In 1982 Spadab searched the market for a new generation of ATMs. Spadab wanted to buy 1,000 new ATMs. The machine that Datasaab had started to develop did not fulfil the demands of Spadab. Instead, Ericsson contacted Omron and in 1984 a contract was signed and the new ATMs could start to be deployed. In total, 900 ATMs of this type were delivered to the savings banks.

The Minuten network competed with that which built around commercial banks (called 'Bankomat'). In later years clearing agreements between the two networks allowed bank customers using each others' network.

4 Conclusion

In this paper we have explored the first steps in the emergence of self-service technology in banking. The focus has been that of the savings banks, since they played an especially important part of the early development. It would be interesting to also closer investigate the early development in Svenska Handelsbanken, that is, prior to 1966/67.

Our purpose has been to research technology and corporate strategy in their social and historical context, that is, the dynamics of the design, construction, development, implementation and use of specialised technology [9] and [10].

What we find among the most interesting aspects in the early development is the key role of Sparfrämjandet and that the interest of the saving banks' computer company Spadab seems to have been low in the beginning. This finding is, however, and as stated before, not as surprising as it may seem since Sparfrämjandet also had the task to rationalize administrative functions among the savings banks.

Also noted is that the ATM technology was not a coincidental innovation made by technicians, it should rather be seen as a part of a modernization process in the savings banks movement that took place in the light of intensified competition and rising transaction costs.

The role of the company Metior is also crucial for the early development and it would be interesting to make deeper studies of the company and its roots. The exact story of the first on-line machines also has to be investigated further.

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