

The Swedish Bankomat in the Early History of the ATM

*On the Occasion of ATMIA's 50th ATM
Anniversary*



Produced by the ATM Industry Association

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Foreword

The Swedish contribution to the development of the early ATM is substantial. The legacy of the Bankomat is, indeed, historic. The author of this essay, Lars Arfvidson, was in charge of technical development between 1965 and 1970 for Securitas/Metior, who jointly produced this early ATM.

In the 50th anniversary year of the world's first ATM, installed in London by Barclays Bank only a week before the first Bankomat, it is special for ATMIA to memorialize this important slice of industry and technological history. In these pages, the growth of the Bankomat is traced as the reader relives a dramatic time of innovation, aided by photographs and images from this not-to-be-forgotten early era.

This, then, is the story of the Swedish ATM, which played a big part in propelling these self-service devices to the forefront of modern banking.

Sit back and enjoy the read.

Mike Lee, CEO ATMIA

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History of the Swedish Bankomat

In mid-1967, there were two different cash machines introduced to the market within a week of each other and without knowledge of each other. One of them was the ATM from De La Rue/Barclays Bank, and the other one was the ATM from a Swedish company Metior, called Bankomat (Bancomat). Both systems were offline.

The Metior Company was founded by the Swedish companies Securitas and Tetra Pak and was situated in Malmo, Sweden. The basic technology came from the development of access control (to premises and houses), using a card + PIN code + registration. This system was introduced at a fair in Stockholm in 1964 by Securitas.



Figure 1: Plastic Cards from Securitas at the 1964 Autumn Fair in Stockholm, Introducing a Passage-Control System

At the Stockholm fair in the autumn of 1964, Securitas presented a passage-control system based on a personal card + four-number PIN code + registration. There was a plastic-coated card with punched holes, optically decoded. The card also had codes for validity (area/company/PIN). The card was inserted in the card reader, and the customer entered the PIN code. If everything was OK, it said “click,” and the door/gate could be passed. The passage, the place and the person were registered. This may have been the first passage-control system of its kind in the world

Looking back at these developments in 1964 from a historical perspective in 2017, we can see this as decisive technology for later uses of card-based customer authentication, such as in financial services.

The next step was to use the system on petrol pumps. The Tankomat was introduced in 1965, so customers could fill up the tank 24 hours/day using the same system: credit card + four-number PIN code + registration for computer handling.

The Tankomat system was opened on December 10, 1965, at an ESSO station in Tumba (south of Stockholm). The customer inserted a coded card in the card reader in the pump and after entering the PIN, the customer could fill up the tank. Initially, the card reader could only be connected to one pump. At the next installation, we had one card reader for all pumps and a selection box.

The Tankomat was probably the first tank automat in the world with card and registration. This may have been the start of unmanned stations.



Figure 2: The First Withdrawal with the Tankomat at the ESSO Station in 1965

The next logical step for Metior, following the deployment of the Tankomat, was to dispense notes. That was why the Bankomat was introduced in Sweden in 1967, just after the De la Rue/Barclays machine. The Bankomat was introduced on July 6, 1967, at Uppsala Sparbank (Saving Bank), north of Stockholm, in Sweden.

There was an agreement with IBM that we should have access to a computer interface, but the interface was not ready in time. As a result, this Bankomat started offline. In fact, this was better for us, as most of the banks, both in Sweden and Europe, did not have access to a computer network at that time.

Bankomat functionality had been discussed by Metior and various banks. The Bankomat had a credit card + four-number PIN code + selection of the amount. It was possible to select one to five notes. The notes were stored in a cassette and were distributed one at a time. The cassette had a counter for the bank to control the amount. The Bankomat had a memory to ensure that only one withdrawal was allowed per day.

Interestingly, the card had to be taken out of the machine before the money was dispensed; otherwise, it was thought the customer would forget the card. Today this is standard practice at ATMs.



Utvecklingschefen vid Metior AB Lars Arfvidson och direktör Tore Vading /SPADAB diskuterar funktionen vid den första Bankomaten i Juli 1967 vid Uppsala Sparbank. Sture Foto/ Uppsala

**Figure 3: The First Bankomat in 1967;
Next to Lars Arfvidson on the Left is Tore Vading of SPADAB**

Throughout the rest of 1967, there were not many sales of Bankomats, but by the beginning of 1968, there was a sales rush. Many European countries installed one or several machines. In Switzerland, for example, all the banks got together (for the first time ever!) to see a demonstration of the new technology, which resulted in an order for 30 Bankomats. The banks collaborated to open together on the same day in the middle of August 1968.

The Bankomat continued to raise enormous interest within the banking world. Within a year, many of the European banks had installed one or more Bankomats, some on a trial basis. Within the next four years, thousands of Bankomats were installed in Europe, the U.S. and Israel.

The next technical step was taken on May 7, 1968, when the world's first online ATM was introduced in a savings bank in the city of Malmo, in southern Sweden. This more advanced Bankomat was connected to an IBM 360 machine via an interface. The Bankomat could also be disconnected from the computer and work offline.



Figure 4: The First Online Bankomat, Connected to an IBM Computer at a Savings Bank in Malmo, Sweden, on May 7, 1968

The code from the card included a scrambling effect, involving the card reader information being translated differently depending on the hole combinations in the card. This was designed to preempt the manufacture of counterfeit cards. The central unit also had a memory for blocked cards (false and lost cards). The central unit printed all the information on a clear-text printer and on an eight-channel hole printer for computer handling. The ID of the person could now be transferred.

Six months later, another Bankomat was installed in Vienna, Austria, also connected to an IBM computer.¹ Around this time, the Lloyds/IBM machine deployed a full online device, backed by a system architecture that could support large-scale deployment.

At the end of 1968, the Bankomat could be delivered with another card with the size CR80 (credit card size).² The information in the card was still of the optical type, and the card was fed into and out of the Bankomat with a motor. In August 1969, the Bankomat was delivered with a magnetic card after our cooperation with the French company TRANSAC, which also got the license to produce Bankomats in France. Once production relocated to France, more than 1,200 Bankomats were manufactured for the French market. The TRANSAC reader included a mechanism that prevented the card from being withdrawn during the actual transaction.

The PIN code was a function of the information in the card. It was unique for the card. The electronic function that made the comparison between the card number and the entered PIN code was called the “comparator,” and this was placed in the safe together with the cassette. The comparator was developed with the help of encryption experts.



Figure 5: Early Bankomat Cash Cards

In 1969, Bankomats expanded into the United States, through a partnership with ADT. Twelve Bankomats were installed; the first was July 3, 1969, at Sumitomo Bank in Pleasant Hill, California.

¹ Articles describing these installations appeared in IBM magazines at the time.

² Plastic card physical characteristics were standardized by ISO in the mid to late-1970s.

Name	Address	City	Completion Date	Warranty Expiration	Inspection Contract
Bank of Commonwealth	Plymouth& Beech Daly	Detroit	1/20/70	Expired	No
Bank of Commonwealth	14401 W. 7 Mile	Dearborn	3/13/70	Expired	No
Bank of Commonwealth	15261 Gratiot	Detroit	3/27/70	Expired	No
Bank of Commonwealth	16850 Harper	Detroit	3/23/70	Expired	No
Bank of Commonwealth	719 Griswold	Detroit	2/27/70	Expired	No
Bank of Commonwealth	19401 Grand River	Detroit	2/27/70	Expired	No
Union Trust Co.	Greenwich, Connecticut		8/16/70	Expired	Yes
Sumitomo Bank*	2107 Atlantic Blvd.	Monterey Pk., CA	6/3/69	Expired	Yes
Sumitomo Bank	101 San Pedro St.	Los Angeles, CA	2/6/70	Expired	Yes
Sumitomo Bank	33 Hillsdale Mall	San Mateo / CA	10/12/69	Expired	Yes
Empire Bank	1800 South Glenstone	Springfield, MO	4/1/71	Expires 4/1/72	No

*New Location at Pleasant Hill

Figure 6: Bankomat Transactions in the U.S.

In 1970, the Metior company was sold to Bofors, and then in 1973, to ABB (ASEA), whereupon manufacturing moved to Vasteras, in central Sweden. Finally, the business was sold to Philips in 1976.

Throughout this pioneering period, a total of more than 2,200 Bankomats were manufactured and delivered, including 12 to the U.S. and 23 to Israel.

The Bankomat's place in the early history of the ATM is assured.