

Jarle Brosveet

IBM SALESMAN MEETS  
NORWEGIAN TAX COLLECTOR:

Computer Entrepreneurs  
in the Making

STS-arbeidsnotat 6/98

ISSN 0802-3573-152

arbeidsnotat  
working paper

Jarle Brosveet

## **IBM SALESMAN MEETS NORWEGIAN TAX COLLECTOR: Computer Entrepreneurs in the Making**

### **1. Social Constructivist Story<sup>1</sup>**

Innovation is a diverse concept. Often we think of innovation as meaning the introduction of a new product, a new production process or the opening of a new market.<sup>2</sup> Innovation is associated with an *entrepreneur* who is the inventor, possesses capital and is willing to take risks. The traditional view is that innovation succeeds because the entrepreneur has got the right kind of intuition, authority and persuasive power to mobilise and combine the appropriate resources.<sup>3</sup>

In most cases the traditional entrepreneur model is too simple and straightforward to describe the introduction and dissemination of modern technology. Both the innovation process and its actors tend to play a more *complex game* than the classic entrepreneurial model seems to imply.

A solution to this problem is to note that entrepreneurs exist, without attempting to explain why the role model was established. In this way entrepreneurs can be treated like "*black boxes*" who emerge and disappear almost by chance. Another solution is to treat entrepreneurs as roles that are being constructed and reconstructed as required by the various actors.<sup>4</sup> This is the *social constructivist* approach to the description and analysis of historical processes.<sup>5</sup> History in the making becomes the study of how actors interact to win acceptance for their views. In doing so they often try to construct some kind of role model that embodies the very qualities of an *opinion leader*.<sup>6</sup>

The process of constructing the entrepreneur is a *battle* of various interest groups or actors who feel that their interests are at stake. The degree of controversy involved cannot be predicted in advance as only the course of events will determine the viciousness of the battle and the eventual victor. However, it is to be expected that the introduction of computers involving restructuring of public administration is such an important task for the actors involved that losing the battle is a major shock and that actors want to avoid being losers. Still, they cannot all be winners. This is where the tension lies. This is also what turns computer entrepreneurs in the making into a fascinating story.

## 2. Humble Beginnings<sup>7</sup>

In spite of the fact that Norway was the third country in the world to acquire Hollerith's equipment for processing census data, such equipment was not much in demand. In a country with very little industrial activity, computing was always a small-scale operation. Fredrik Rosing Bull's new inventions, which replaced the worn-out Hollerith equipment in the 1920s, did little to change this fact.

In 1935, when IBM established its local office in Oslo, the firm had only three customers. This situation did not change much during World War II when relations with IBM headquarters were broken off because of the occupation of Norway by Nazi-German troops. IBM, who were far better represented than its competitors, Bull and Powers-Samas, managed to have 21 contracts signed for the installation of punched-card equipment by 1945. A major source of income at the time was the sale of punched cards, which had to be manufactured to exact specifications. Even so, the Oslo branch would receive part funding from IBM headquarters in New York to keep their operation going in Norway.

In order to serve their enthusiastic but reluctant customers, IBM had to establish a service bureau in each of the major cities Oslo and Bergen by 1946. Four more cities followed suit during the 1950s—Trondheim, Stavanger, Pörsgrunn and Sarpsborg. The investment in service bureaux on the part of IBM was caused by the unwillingness by most industries to lease their own punched-card equipment. The general feeling was that expenses were far too high in relation to the limited tasks accomplished such as payroll and accountancy.

Also, punched-card equipment was subjected to severe post-war quota restrictions imposed by the government due to the priorities of reconstruction work and the development of a modern welfare state. The ruling Social Democratic Party's slogan "Work for Everybody" was incompatible with the concept of computerisation. In addition, there was a lead time of approximately two years for those industries lucky enough to obtain an import license before the equipment could be delivered and installed by IBM. All these factors made the introduction and selling of mechanical punched-card equipment a very hard task indeed.

During the first post-war years, IBM tried to track down labour-intensive routines in firms and public institutions handling huge quantities of data. These were the preferred customers who could effectively increase the revenue of IBM by renting equipment and purchasing lots of punched cards. The routines could be found within banking, insurance, and—not least—in the public sector. For IBM the problem was to gain influence and generate enough enthusiasm so as to turn the managers of these routines into new customers.

Most major insurance companies had ordered punched-card equipment before World War II, either from IBM or Powers-Samas, or they were using some of Fredrik Rosing Bull's machines. Because of their long-term insurance contracts based on fixed instalments requiring few adjustments or updating on a daily basis or even weekly basis, the insurance companies became the most prominent users of punched-card equipment in Norway during these early years.

The banks were not equally enthusiastic. Only one major bank had punched-card equipment installed before World War II. Such equipment was considered

irrelevant in the daily operations of the banks because of the inability of punched cards to update the balance of individual accounts in an efficient manner as well as to provide for manageable storage and easy retrieval of transaction data. Even as late as 1958, IBM had no Norwegian banks among its customers.

As for the public sector, high-volume processing of data occurred manually in many institutions. However, the general interest in automation was very low. Most public institutions were in doubt whether automation was the right way to go, because emphasis in general was placed mainly on inventing more efficient manual routines, improving the layout of forms and the setting up archival systems.

Some government pension schemes, the armed forces and the Norwegian State Railways were early users of punched-card equipment, mostly for the processing of wages or pension payments which were distributed by the Post Office by means of the relatively new post giro system. Major national routines such as these were ideal for IBM but the government world was hard to influence even if the IBM salesforce spent much of their time visiting managers and extolling the virtues of the new technology.

At times, it seemed as if computerisation was a lost cause and that its propagation was a disheartening experience for the IBM salespeople. However, the IBM staff held sway, believing that the post-war restructuring efforts stressing manual labour and disregarding the economics of automation would soon disappear. An encouraging sign was the establishment in 1948 of a government agency for office work efficiency. However, the aim of this agency was to make manual routines more efficient rather than to automate these routines. As years passed, the agency came to exert very little impact on automation in Norway. In the early 1950s, it became clear that IBM had to seek other partners in order to introduce automation on a grand scale.

### **3. IBM's Conquering Strategy<sup>8</sup>**

Applying a bit of social constructivist theory, we can say that the introduction of automation and punched-card equipment into Norwegian government was a process that had to be cleverly planned and constructed. IBM had to seek out the right partners and also construct a test case that proved convincing in the eyes of the users. In other words, IBM would have to set up some sort of laboratory into which they would take specific government data processing problems and show that the best solution could be obtained only when automation was applied. Proud and confident they termed this solution "the IBM method" even before it could be realised.

Isolating specific government problems by bringing them into the laboratory in order to solve them was only the first step. When the laboratory tests had been completed successfully, IBM would have to shift the focus from the laboratory to the real world and find the right way to implement their solutions in government offices. This step required more than technical expertise. Due to the costs involved, the implementation implied bringing together various government bodies in various places and unite these bodies in the belief that the traditional hierarchies of government had to be amended or reshaped in the interest of automation.

This three-step procedure might seem both complex and expensive. Bringing specific problems into the laboratory, designing appropriate solutions and

implementing these solution in a user environment required much expertise as well as labour. Expertise meant more than technical competence and salesmanship. IBM also had to gain insight into the problems of the user in order to select the best solutions. From a business point of view these were expensive steps to take. IBM would have to take on the automation of government routines as their internal project with no funding coming from the government and even without a guarantee that the final solutions would be adopted by the intended users so as to recoup the costs involved as well as to yield some surplus.

However, to IBM this was a critical moment. By investing in "the IBM method" and proving its effectiveness they bargained for a fast return on their investment. Their belief was firm that appropriate solutions could be found, and also that these solutions, once demonstrated to work flawlessly, were sufficiently convincing so as to spur government enthusiasm and lead to the signing of major contracts. IBM headquarters, intent to beat their competitors early on, approved of this scenario.

From the late 1940s onward, IBM salesmen acted as proverbial moles, digging below the surface of government life to construct their burrows. In a constructivist sense, they tried to set up alliances, find new friends in high places and make "the IBM method" a household concept among decisionmakers. IBM salesmen were encouraged by their managers to spend as much time as they could in government offices and only call back to make reports on their progress. Needless to say, this aggressive "technology push" strategy soon brought results.

#### **4. IBM Among Insurgents**

To say that "technology push" was the decisive factor is a gross simplification. Rather, IBM entered into an interchange with their intended customers to create what in constructivist terminology is known as a symmetric relationship. In this case, the symmetry meant that IBM could not attain their goals without the active co-operation of their customers. Conversely, the customers were reliant on IBM for their successful application of automated data processing.

Because of these considerations, IBM could not pick a government application of their own choice, make it run on their equipment, and subsequently hope for success. First of all, a fusion or symbiosis of IBM and governmental goals had to be forged, out of which consensus would emerge as to which application served IBM's and the government's interests best. Naturally, IBM's interests would be purely commercial, whereas the government's interests were to obtain increased efficiency, reliability and a lower overall cost per unit of data processed.

The problem in forging a symmetric relationship was that government plans for automation were, generally speaking, far too rudimentary. The armed forces, a government pension fund and the Post Giro office were processing high volumes of punched cards on their equipment but hardly any new applications seemed to emerge. Then, in 1950, government plans were in the pipeline for a tax reform. The system of paying personal and company taxes based on last year's income proved much too deficient for the requirements of the modern welfare state. Now the government

wanted to implement the principle of tax payments based on current income. These payments had to be followed by a supplementary statement of income and assets at the end of the year to allow for the exact computation of the year's taxes.

Needless to say, this tax reform was going to be one of the most complex social post-war reforms ever. It was passed by parliament in 1952 but its implementation was long in coming and caused an impasse in several government offices in the early 1950s. In 1953, the Ministry of Finance declined to discuss the possibilities of automation due to the as-yet undecided distribution of authority between central and local authorities in matters of tax collection. Their advice was to wait for a clarification pending the eventual implementation of the law, which took place as late as 1957.

During this deadlock IBM tried to forge an alliance with enthusiastic and impatient tax collectors who were hard pressed with manual work and who envisaged a complete breakdown following the implementation of the new tax laws. On their visits to government offices and at various conferences throughout the country, IBM salesmen met with increasingly frustrated and infuriated tax collectors who were totally estranged by the indifferent attitude shown by the Ministry of Finance. Whereas the Ministry were concerned purely with the traditionally bureaucratic and administrative sides of the tax reform, which did not include the introduction of automation, the tax collectors felt that automation played a major part in the implementation of the reform.

Since the tax collectors met with little response and even rejection when trying to discuss this and other matters with the Ministry, IBM salesmen unexpectedly emerged as sympathetic listeners and perceptive friends who were ready to discuss the design of automated tax calculation routines. At a moment of governmental distress, IBM's incessant sales efforts seemed to pay off. Finally, a target group of potential users seemed to materialise, and IBM could soon think of bringing an expertly defined set of governmental problems into their laboratory with a view towards finding an automated solution.

The worrying aspect about this development was that IBM sided with the insurgents in a conflict within government. By supporting the cause of local tax collectors, IBM came to exclude the participation of the Ministry and central government. This must have been a dilemma at the time, as IBM now got on unfriendly terms with major politicians and decisionmakers and risked losing other major government contracts. However, since such contracts seemed very distant in the early 1950s, IBM apparently felt the need to unite with whoever was sympathetic to their cause. The company sorely needed a major government contract, and this could well be the only opportunity in the foreseeable future.

## **5. Defying Central Government**

The concept of automated processing of tax data did not originate from IBM, at least not in Norway. Some tax collectors are known to have been thinking about automation ever since the first companies started using punched-card equipment before the advent of World War II. After the war, news of comparable Danish initiatives spread

throughout the country. In this way the concept of automating tax payment calculations had been maturing for about a decade before IBM started its sales campaign in the early 1950s.

Also, contacts were established mainly by inviting IBM salespeople to meetings held by local branches of the tax collectors' association. In many places, the local IBM salesman was treated like a normal member of the association and received an invitation to every meeting, regardless of the topics being discussed. In this manner, a close and informal relationship often resulted between the individual tax collector and the IBM salesman, thus turning many tax collectors into dedicated IBM followers. At the same time, IBM gained valuable insight into typical problems experienced by the tax collectors as well as their views of the most relevant solutions.

As can be seen, contacts were established at the individual rather than at the institutional level. Gradually, a grassroots movement developed among the fraternity of tax collectors. This movement was supported by IBM, whose salespeople were allowed to act to the full as moles, spurring the realisation of highly controversial and potentially dysfunctional aspects of government. The automation plans, if carried on, would have to be introduced in defiance of central government policies to postpone automation until most of the other rules and regulations associated with the new tax legislation had been worked out.

It contributed to the alienation of local tax collectors vis-à-vis central government that information about automation had to be distributed mostly by means of locally produced flyers, in journals and magazines not normally read by these government employees, and through product demonstrations by various suppliers of office equipment. There emerged a widening gap between the real requirements of this group and the lack of interest expressed within the formal structure of which they were a part. In fact, the tax collectors' association, acting on local initiatives, contributed more than their government superiors towards bringing out their problems and finding workable solutions.

A typical event which spurred much local interest was an IBM office equipment fair held in Bergen in November 1951. Tax collectors from the province of Hordaland were invited to the fair at a particular date. In a flyer produced for distribution among the tax collectors themselves they were reminded of this unique opportunity to be informed of the very latest in office equipment and archival systems. Among other things, "the IBM method" would be demonstrated.

The flyer was distributed by the province tax collection supervisor, who some days later summoned a select group of tax collectors and the IBM salesman in Bergen to a meeting. The purpose of the meeting was to discuss the possibility of using punched-card equipment for the calculation of tax payments and for the printing of payment requests and reports. The meeting concluded by the setting up of a local committee with a view towards investigating if the local IBM service bureau could be relied on to deal with these tasks.

We can conclude that by the end of 1951, the construction of tax payment calculations as a joint venture between local tax collectors and the IBM had taken a big step forward in Bergen as well as in other Norwegian cities. The tax collectors emerged as local innovators, soon to be united as a faction of dedicated automation fans organised on an ad hoc basis. A good many tax collectors and IBM were

regrouping, intent to combat the indifferent attitudes of central government and find immediate solutions to the many chores experienced in the processing of tax payments.

## **6. Tax Collector Hybrid Role**

Once the rudimentary strategies of each of the actor groups had been defined, things happened quickly. By New Year 1952 IBM had started to expand their sales staff, and the tax collectors in the Bergen district were eagerly awaiting IBM's presentation on paper of an automated tax collector's office. Only the central government's plans for automation were just as remote as they had always been. A really powerful alliance could result if IBM and the local tax collectors would find a way of realising their joint scenarios.

A very automation-conscious person in Bergen happened to be the tax collection supervisor, Mr. Hans W. Gullestad, who was central government's taxation representative in the region but did not share his employer's reluctant attitude towards the application of new technology in the field. Incidentally, he was supported by the district governor, Mons Lid, who was acting in a dual capacity as central government's loyal servant on one hand and as the advocate of local applications of new technology on the other. Apparently, Lid managed to pursue this dual strategy admirably of being at the same time loyal and disloyal, as he was soon called upon to become the country's Minister of Finance.

Gullestad was acting tax collection supervisor but he was too young and inexperienced to be qualified for the job permanently. Instead of going back to his former job as a subordinate civil servant, he could well imagine striking out on his own to lead a new movement within public administration. In this case, the automation of tax calculation routines came as a gift from heaven. Gullestad made good use of his last months as tax collection supervisor, circulating mimeographed flyers about the use of new technology to all tax collectors in the region. Also, he sided with IBM at meetings and demonstrations so as to lend added credibility to "the IBM method".

In fact, Gullestad took no time to assume the role of a hybrid entrepreneur. When IBM's description of "the IBM method" for processing tax return data was presented in May 1952, it had acquired the shape of a memo signed by Gullestad. From this moment on, it became clear to everybody that the former tax collection supervisor had entered the role of a technical expert comparable to that of the IBM salespeople. Gullestad chose as his strategy to follow the technical expertise. In this manner Gullestad defined the most sensible path to follow for those who were in favour of the automation for tax calculations.

Part of Gullestad's strategy as a hybrid entrepreneur was to stress that "the IBM method" meant a gentle transition from current practises. Also, not too many municipalities would be allowed to take part initially. This restriction acted as a teaser and was at the same time a reassurance to those who were sceptical that the transition might get out of control. Furthermore, Gullestad stressed that the initial goals were to gain experience by means of a small-scale implementation. In this manner, user



considerations were maintained as a chief concern and the negative technical side-effects likely to be negligent.

In 1952 it became clear that those in favour of automated tax computation would have to assume the role of insurgents as well as to become hybrid tax collectors like Gullestad. To most right-minded civil servants this was a giant step to take, not least because automation by way of "the IBM method" was an experiment with no guarantee of success. The joint venture by Gullestad and IBM was a risky and expensive undertaking. For the time being the joint venture existed only as a short and sketchy memo which few non-technicians could understand. To be sure, what happened next was going to be a decisive moment in the history of computing in Norway.

## **7. Government in Revolt**

Gullestad and IBM could have picked the wrong course or the wrong moment and ended up with no followers. As it were, Gullestad's persuasive powers must have been immense. Incredible as it may seem, the first municipality in favour of trying out "the IBM method" was Haus, a small community of only 4,500 inhabitants. The tax collector of this municipality had been a driving force in the committee that asked IBM to come up with plans for an automated tax collector's office.

Some of the other municipalities in the Bergen region soon followed suit. When time approached for tax calculations in 1953 to take place, a total of seven municipalities had signed up in order to try out "the IBM method". The question was if this was a local movement or the start of a tidal wave that would soon be rolling across the country. If tax collectors throughout the country followed suit, it would mean a whole section of local government in uproar against central government tardiness in matters of office automation.

It counted against the nation-wide success of the group of tax collectors and other automation enthusiasts that they were loosely organised. Neither did there exist any consensus regarding the appropriateness of using automation to achieve more effectiveness in the public sector. Some civil servants were devoted advocates of introducing new archival systems and improved form construction principles in preference of automation. These elements of disbandment within government could cause many tax collectors to hold back if central government decided to oppose local government with a view towards postponing the automation plan.

Another factor which counted against the success of the local promotion of automation was the fact that the Bergen group went for IBM without issuing a tender so as to involve other manufacturers. Such impartiality was generally frowned at in government and was easily associated with bribing and other dubious practices. Again it must be said that most right-minded Norwegian civil servants normally would think twice when confronted with plans involving the slightest suspicion of malpractice.

Insurgency, malpractice, disloyalty, misconduct, lack of organisation and lack of consensus as to means and goals characterised the tax collectors' movement. In the face of all these detrimental factors, how could the movement hope for success?

Wouldn't the tax collectors be swept off the ground by a single statement by central government claiming malpractice and breach of loyalty?

Probably they would if central government had acted accordingly. In the event, central government did not in any way oppose the tax collectors' movement. First, for bureaucratic reasons central government did not exert direct control over civil servants at the local level. Second, central government may have underestimated the initiatives taken by the Bergen group of tax collectors, which, considering their informal nature, could easily be written off as a spurious incident. Third, there were more urgent tasks to deal with, as the tax collectors had also launched a campaign for higher wages and threatened to go on strike during the summer months instead of sweating over their tax calculations.

Since the tax collectors were free to carry on their line of insurgency, IBM had at their disposal an enthusiastic user group of tax collectors. IBM's goals were within reach. If they could persuade more tax collectors of the appropriateness of "the IBM method" the company would be able to introduce automated tax calculations for the whole country involving a population of nearly one million taxpayers. The sheer volume of data processing would mean a lot of expensive IBM equipment installed in various places and the sale of huge quantities of punched cards. In view of these prospects, IBM were intent not to fail at the last fence.

## **8. IBM Salesman Hybrid Role**

As explained earlier, IBM was prepared to set up a laboratory where they would take the expertly defined tax calculation problems, find a solution and subsequently implement it in the real world. In social constructionist terms, these are there three major steps called the translation process.

In order for this translation process to succeed, it was necessary for a major spokesman of the tax collectors to assume the role of a hybrid entrepreneur. Also it required that at least one of the IBM salespeople or technicians acquired intimate knowledge of the problems of tax calculation. The purpose of constructing a hybrid tax collector was to convey the intricacies of the technical solution to their fraternity in non-technical terms. The purpose of constructing a hybrid IBM salesperson was to ensure that the programming of IBM sorters, collators and calculators would comply with the intricate set of taxation rules to be applied.

IBM worked seriously at the problems and had a tentative solution ready in time for the annual congress of the Norwegian tax collectors' association in October 1952. Needless to say, the congress was held in Bergen. IBM were able to demonstrate a complete batch of beta-version tax calculation routines using fictitious taxation data. This was the first time ever that such a thing had been attempted and proved that Gullestad's sketchy memo combined with realisation of the two hybrid roles worked miracles.

IBM pressed forward and asked a select group of knowledgeable experts among the tax collectors to comment and supplement the description of the calculation routines. As a result, in December 1952 IBM could present a complete description of the implementation of workable tax calculation routines. The description existed in

two versions: a technical one for the IBM salespeople and a non-technical one for the tax collectors.

Several IBM salespeople were involved from the beginning, but when the descriptions were finalised, Mr. Gunnar Wethal, although unnamed in the IBM documents, was the one who eventually took on the hybrid role. He has stated in an interview that the two descriptions were in fact his work.

IBM's strategy was to put great efforts into putting the finishing touches to the routines during the winter and spring of 1953. It was a major responsibility for the company to accept batches of taxation records, some of which might be incorrect, and produce faultless calculations to the tax collectors' satisfaction. In fact, IBM did not trust their descriptions to be understood and followed to the letter. Their salespeople also had to go on tour in order to drill the tax collectors in the appropriate preparation of data. Many test runs were needed before the tax collectors were allowed to hand in real data for processing.

For the IBM salespeople this was an arduous and exhausting time doing a job for which they were quite unprepared. However, they duly completed the tasks assigned to them, hoping that their efforts would bring about sales in the short run. The paramount importance of this work also expressed itself in unexpected ways. At the time Wethal was a young man enlisted in the armed forces. The executive director of IBM Norway made use of his personal contacts in the armed forces to obtain a permit for Wethal to work in the evenings at the realisation of various plans, directions, descriptions and plug-board solutions required in the IBM tax calculation project. The armed forces conceded that the permit was issued due to the importance of Wethal's work in non-military life.

## **9. Courting Disaster**

Most of IBM's tax computation runs, using Wethal's recently completed punched-card routines, were effected during the summer of 1953. The tax collectors' offices applied graphite marks to the punched cards before they were sent to the IBM service bureau for optical mark sensing. Then followed a sequence of sortings, collations and listings as well as several runs through the calculator in order to complete the complex set of computations.

After long evenings and nights in the punched-card equipment room, the IBM staff finished the task to everybody's satisfaction. A few irregularities were straightened out along the way. At a meeting between IBM and representatives of the tax collectors in the autumn of 1953 minor changes were agreed upon. Also, the seven municipalities who were guinea-pigs that year decided to go on using "the IBM method" in 1954 as well.

Even if IBM's long-term strategy was to sell or lease equipment to their customers, it was still too early for contracts to be signed with the local authorities. The dilemma facing IBM was that they had started a successful operation that could not be called off. Consequently, the IBM service bureau had to cope with yet another year's tax computations. More municipalities wanted to take part in 1954, but IBM managed

to make an agreement that only eight new municipalities could join this year in addition to the seven municipalities continuing from 1953.

In 1955, still more municipalities wanted to make use of the IBM service bureau for their tax computations. The success of "the IBM method" was irreversible even though it taxed IBM's small operation in Norway to the limit. An enormous data processing capacity had to be amassed to keep the municipalities satisfied. There was no way of keeping back, and IBM accepted all tax computation orders while at the same time doing their utmost to have sales or leasing contracts signed as soon as possible. As a result 100 municipalities with nearly 500,000 taxpayers had their computations done by IBM in 1955. It was four times the number of records processed in 1954, representing one third of all Norwegian taxpayers.

IBM never enjoyed equal success in Norway. At the same time the company was at the brink of disaster. The success turned into an expensive nightmare. A train-load of old computing machinery had to be brought in from Sweden, more staff had to be hired on a temporary basis, and a sports hall in Oslo had to be rented from May to September where the equipment was installed. In addition, their staff had to work around the clock supervising the operation throughout a long and hot summer.

Success was not enough. If IBM Norway could not produce major sales or leasing contracts, the headquarters in New York would most likely cancel the costly tax computation runs, replace the management and develop new strategies that most likely would not be favourable to the notion of IBM dominance in local government data processing.

## **10. Shaping Regional Solutions**

To IBM there was light at the end of the tunnel. In 1954, the municipality of Oslo had its own punched-card equipment installed and were doing the tax computations themselves. The other municipalities throughout the country were too small and economically weak and would need some kind of inter-municipal solution in the shape of separately organised service bureaux. The notion of regional inter-municipal service bureaux run by local government was adopted from Denmark.<sup>9</sup>

Again, the active Bergen group of tax collectors came to the rescue. Gullestad had obtained government funding for travelling to Denmark in order to study the Danish solution. Representatives of IBM joined him on this trip. Needless to say, Gullestad came back as a true convert of the Danish arrangement. He immediately made a proposition to the district governor, Mons Lid, who had a soft spot for the local adoption of new technology, that the first Norwegian local government service bureau be established in Bergen.

As it turned out, more than enthusiasm was needed to convince Lid that an inter-municipal service bureau was a viable proposition. Gullestad's calculations were judged far too optimistic because they showed that the expected income would only cover half of the annual expenses. Consequently, Lid asked that the committee of local tax collectors create the needs required for the local government service bureau to emerge as a profitable undertaking.

It seems that enthusiasm was a sufficient requirement for Gullestad to act on his own. Unwilling to wait for the project to show the profitability aspects required by Lid, he personally ordered the necessary equipment in June 1953 and signed the leasing contract without asking neither the district governor nor the Ministry of Finance for permission, which he should have done. Again, there was no rebuke for disloyalty or misconduct.

The revised calculations were presented in a report to the district governor in September 1953. Now the red figures were gone and even a small surplus was envisaged during the first year of operation. The committee had based its calculations on IBM's fees, dispensed with leasing the expensive IBM calculator, and kept staff costs to a minimum. Even so, using the IBM service bureau would be less expensive than using the local government service bureau. All the same, the solution was presented as a requirement in order to avoid the capacity problems that the committee predicted would occur at IBM during the next few years.

These arguments settled the case. The district governor's office made an advance payment of NOK 100,000 as capital base for the new service bureau in Bergen in order have it founded by the end of 1953. The amount was to be repaid gradually as municipalities in the region saw fit to buy a share in the service bureau and become owners. In this way, the first local government service bureau outside Oslo was established.

To be sure, IBM were relieved. Eventually, chances were that the company's efforts vis-à-vis the local tax collectors would pay off, and that more leasing contracts would be signed before long.

## **11. From Grassroots To National Policy**

What happened next is a study in bureaucratic ineffectiveness versus the dynamics of a grassroots action. Central government were concerned about the local initiative shown by the Bergen group of tax collectors. Even if Gullestad was not rebuked, his actions caused great concern. In May 1953 the Ministry of Finance and the Ministry of the Interior advised the municipalities to show great caution in acquiring new technology. In August central government warned that actions would be taken.

However, as already noted, central government had no authority to exert direct control at the local level. This is why they asked the association of municipalities to make a report on the introduction of punched-card equipment at the national level. Since the association had no independent expertise of its own, they turned the assignment over to Gullestad and his tax collector friends, whom they regarded as experts. In this way the intention of central government to produce a critical report was thwarted. Now the assignment of making a national report was in the hands of the foremost advocates of municipality-based technology use. In effect, a grassroots movement had been asked to recommend the national policy of automating tax computing.

The report was produced in due course. By that time central government seemed to have given up, as no more statements are on records from that quarter. The association of municipalities evidently tried to convince Gullestad that the report

should recommend a centralised solution run under the auspices of the association. After wavering for a couple of months in the face of the pressure exerted by the association, Gullestad and his friends declined to accept their preferred recommendation. When the report was made available in September 1954, it was firm in its unconditional praise of "the IBM method" and the locally based organisational model implemented in Bergen.

Gullestad and his ad-hoc group of insurgent and disloyal tax collectors had won through. Now even the association of municipalities resigned. What was previously regarded as misconduct now became the accepted way of solving computing problems in local government. A grassroots action had been elevated to national policy. The defeat of the association and central government was so serious that these centralised centres of power treated the matter of local government data processing with little interest until the 1990s. After the definite breakthrough of the Bergen model in 1954, local government was to a large extent left to fend for itself in matters of automation.

## **12. Systems Manager Hybrid Role**

While the battle of insurgents and incumbents were raging in summer 1954 over the national policy regarding local government automation plans, IBM were lurking in the wings, diligently processing tax data for 15 select municipalities. It was only when the insurgent tax collectors had won the battle that IBM accepted all tax computation orders for 1955 while at the same time putting pressure on the tax collectors in various parts of the country to have sales or leasing contracts signed as soon as possible.

IBM's most notable contribution towards supporting the insurgents during the battle was the partitioning of Norway which the company saw fit to undertake. As presented in the September 1954 report, IBM divided the country into seven regions according to economic criteria. Each of the regions had a sufficiently large number of taxpayers so as to sustain the operations of a local government service bureau. Processing of tax data would be the main activity of these bureaux.

For the management of each bureau IBM invented the hybrid systems manager role, combining the skills of a tax collector, an IBM salesman and an IBM-trained systems manager. Needless to say, such qualifications were hard to obtain at the time. Gullestad came close to fulfilling the ideals when he agreed to take some of the IBM courses. In other cases, tax collector and salesman skills had to be dispensed with. The most important thing for the running of the service bureaux was technical proficiency. Userfriendliness was no issue at the time, and most users were only concerned that the various sortings and computations were done correctly.

By recruiting mainly systems managers to run the local government bureaux, IBM introduced a technical bias that had negative effects in the long run. Most of the managers remained in office well into the 1970s and 1980s when users demanded that their requirements had to be taken seriously. This change of attitude from purely technical operations to user participation appeared to be incompatible with the basic interests of the systems managers. Most of them came to oppose the users, whom they were supposed to serve and who were also shareholders.

In the 1950s nobody could foresee these negative effects. Since the hybrid systems manager did not exist in the market and the bureaux could be run satisfactorily by ordinary systems managers, dispensing with tax collector and salesman skills did not seem like a serious flaw. Later, it became clear that the managers either should have been engaged on short-term contracts or had a plan for re-education to provide them with additional skills to compensate for the technical bias.

It can be said that the tax collector hybrid role and the IBM salesman hybrid role were successful because of their transitional nature. They were required in order to construct a joint venture in the shape of local government service bureaux. The systems manager hybrid role, being of a permanent nature, was cleverly construed at the outset. Sadly, neither IBM nor the management or owners of the local government service bureaux saw fit to reflect on its composite nature and develop the role to its full potential. Mostly due to this neglect, the service bureaux became inflexible organisations unable to adjust to the organisational stress to which they were subjected. However, the service bureaux proved able to adjust without much difficulty to the change from electro-mechanical machinery to computers as well as the rapid technical development of big computer era, since the technical field was the expert domain of the systems managers.

### **13. Computerisation**

The first two local government service bureaux were formed during 1953-1954 but 1955 passed without a single new contract being signed. It appeared that most municipalities were very satisfied with the efforts of IBM service bureau in Oslo and saw no reason why they should buy or lease their own equipment or take the trouble to organise local government service bureaux. IBM's excellence turned out to be their worst enemy. IBM realised that they would have to resort to some drastic measures to have more sales or leasing contracts signed.

First, IBM threatened to halt their service bureau operations completely. Next, they invented a deterrent strategy, claiming that their services were inferior and more expensive than those of the local government bureaux. This scenario was spelled out in writing to those municipalities who were slow to react. It must be one of the few documents extant in which IBM voluntarily have denounced their supremacy.

The deterrent campaign made its mark, and during 1956-1957 IBM were able to sign contracts for the establishment of four new local government bureaux, covering the southern, eastern and western parts of Norway. The northern part of the country, due to its sparse population, was excluded from IBM's initial plans for the computerisation of local government and had their own local government service bureau organised as late as 1963. Middle Norway proved to be a problematic region for various reasons and their service bureau was not established until 1970. In this way, IBM succeeded in constructing decentralised computer services, mainly for the processing of tax data, throughout the whole country in the period 1954-1970.

Most of the local government service bureaux started out using punched-card equipment. Towards 1960 the introduction of electronic computers became a tempting proposition, not least because IBM subjected the management and owners of the local

service bureaux to a massive technology push. Again, the Bergen bureau, being the most advanced and having Gullestad as its enthusiastic and well-adapted hybrid systems manager, was at the forefront. As early as 1955, during the first year of the service bureau's existence, Gullestad joined forces with several Bergen companies in the private sector and the University of Bergen in order to acquire the country's first commercial computer, an IBM 650.

It was an expensive endeavour, but Gullestad planned to centralise the nation's tax data processing on the new computer so as to avoid the extensive reprogramming of the punched-card equipment when the tax reform finally was made effective in 1957. With the unflinching support of IBM he managed to complete even this major feat with success. The Bergen model, advocated by a hybrid systems manager, had proved its flexibility in adapting to the simultaneous change of technology and new taxation principles.

After this success, the tax calculations could have been run as a centralised operation. However, Gullestad and his followers never swayed from their concept of having at least seven local government service bureaux in operation throughout the country. Neither did central government intervene, as their focus was on restructuring the administration and adapting the other routines required by the new tax reform. In fact, central government now appeared to be satisfied that a separate structure had been set up to take care of the computations. For this reason, the local government service bureaux continued to exist, and they gradually adapted the Bergen model by leasing their own computers, mostly IBM 1401s and later IBM 360/370s, and by running copies of the tax calculation programmes that had been developed for the IBM 650 in Bergen.

## **14. Decline and Annihilation**

In the early 1960s, the local government service bureaux were a huge success. From a technical point of view, they possessed the latest IBM equipment and expanded their operations rapidly so as to keep abreast of the rapid changes in computer technology. From an applications point of view, they managed to cope with the transition to new taxation routines admirably and had also taken on various new tasks. Except for Oslo, none of the other municipalities were thinking of buying their own computers. Until the advent of less expensive minicomputers in the 1970s, the local government service bureaux reigned supreme in their regions.

As explained earlier, their management was unable to adapt to the list of new demands that users made up to during the 1960s. Discontent mounted and many users started looking for alternative solutions. Also, central government was aiming for a centralised data processing solution as tax collection was turned into a central government operation in 1965. Even IBM's support became lacklustre after their attempt had failed to convince the management of the local government service bureaux that the processing of tax data should either be reorganised among 13 bureaux running shared IBM 1601s or remain a centrally run operation after the phasing-out of the Bergen IBM 650 during 1962. In spite of growing discontent and frustration, there was no immediate crisis. Unexpectedly, central government came to the rescue, much



because its centrally located tax data processing solution was slow in coming and the local government service bureaux where relied on to process tax data until 1969.

The 1970s and 1980s were full of miseries. The local government service bureaux lost the processing of social security benefit data, another mainstay in their economy. Also, their technology-centred staffs operating big computer systems were chastised as being out of step with recent development. Municipalities started buying their own mini-computers and PCs and finding more user-friendly solutions. In the 1980s several of the old managers were fired or forced to leave. At the end of the decade, the bureaux, facing bankruptcy, merged into one company with a centrally located computer system, although branch offices were retained throughout the country.

Things went from bad to worse until 1995, when IBM decided to buy the tattered remains of their successful 1950s construction. They did so not for sentimental reasons. In effect, IBM were making plans to reshape information processing in local administration and make a profit from it. However, it is still too early to tell if the restructuring will ever come about. Within government, many aspects have changed considerably over the last decades and IBM is not the uncontested leader whose ideas open up new horizons. Also, there no longer exists a group of local insurgents with which IBM can unite in order to implement new concepts. Also, central government has pledged itself towards solving some of the data processing problems of local government and are implementing several new networks that define and standardise the local data processing environment of the 21<sup>st</sup> century. For the time being, IBM's success story of the 1950s and early 1960s seems like being a phenomenon never to be repeated.

## Notes:

<sup>1</sup> The main body of the article is a condensation and simplification of the analysis found in my doctoral thesis in Sociology at the Norwegian University of Science and Technology (NTNU), Trondheim, the title of which is: *EDB inn i kommunene! Kommunedatatanken i aktørnettverks-perspektiv*, STS report No. 26, Trondheim: Centre for Technology and Society, 1996. I am most grateful to Knut H. Sørensen at the Centre for Technology and Society at NTNU for his advice and guidance.

<sup>2</sup> Joseph. A. Schumpeter: *The Theory of Economic Development*. Cambridge MA: Harvard University Press, 1934/1968. In addition, see Mark Elam: *Innovation as the Craft of Combination. Perspectives on Technology and Economy in the Spirit of Schumpeter*. Linköping: Department of Technology and Social Change, 1993.

<sup>3</sup> See for instance Everett M. Rogers: *Diffusion of Innovations*. 3<sup>rd</sup> ed. New York: Free Press, 1983.

<sup>4</sup> The notion of opening up the "black box" in technology studies was introduced in Nathan Rosenberg: *Inside the Black Box. Technology and Economics*. Cambridge: Cambridge University Press, 1982.

<sup>5</sup> A standard introduction to social constructivist theory is found in Wiebe E. Bijker, Thomas P. Hughes and Trevor Pinch (eds.): *The Social Construction of Technological Systems. New Directions in the Sociology and History of Technology*, Cambridge MA: MIT Press, 1987; and Wiebe E. Bijker and John Law (eds.): *Shaping Technology/Building Society. Studies in Sociotechnical Change*, Cambridge MA: MIT Press, 1992. Of particular interest to the use of social constructivist theory in history is Wiebe E. Bijker: "Sociohistorical Technology Studies" in Sheila Jasanoff *et.al.* (eds.): *Handbook of Science and Technology Studies*. Thousand Oaks CA: Sage, 1994, pp. 229-256.

<sup>6</sup> The concept of an opinion leader in the shape of an "obligatory passage point" was elaborated in Bruno Latour: *Science in Action: How to Follow Scientists and Engineers through Society*. Milton Keynes/Cambridge MA: Open University Press/Harvard University Press, 1987.

<sup>7</sup> The history of IBM in Norway is described in Gunnar Nerheim and Helge W. Nordvik: *Ikke bare maskiner. Historien om IBM i Norge 1935-1985*. Oslo: Universitetsforlaget, 1986.

<sup>8</sup> The strategies of IBM and the other actors were mapped through interviews with some of the major persons involved at the time, such as Gunnar Wethdal and Hans W. Gullestad. Additionally, written documents such as government white papers, journals and newspapers supplemented the oral accounts. By chance, I also recovered and was given permission to make extensive use of the personal archives of the late District Governor Mons Lid.

<sup>9</sup> For a description of the development in Denmark, see Lars Heide: *Hulkort og EDB i Danmark 1911-1970*, Århus: Systime, 1996.