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# **The Norwegian National IT Plan, 1987–1990: Whence It Came, What It Was, and How It Ended**

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**Abstract.** In the late 1970s and early 1980s most of the technically advanced nations organized national R&D programs for speeding up the intake of information technologies in industry and society as a whole. In addition, Norway organized a National IT plan that ran for four years from 1987–90. The idea of having a national plan was initiated in 1982–83. This paper shortly covers events of around ten years from 1982 until 1991. There is a short description of the relevant processes and of the central actors, and of the technical and political background where the planning processes took place. There is also a short analysis of why things came about as they came, what the consequences of the plan were, and whether we could have done things differently. The main priority of most of the other national IT plans was to support their computer industries through public financing of relevant research. The Norwegian IT plan came with a wider agenda. Not only was it to be a support plan for the Norwegian IT industry, but it was to be a plan for transforming society as a whole, from the industrial to the post-industrial stage. Therefore, the Norwegian IT plan can be seen as a result of negotiations among the “narrow” industrial interests and the wider interests of the emerging information society.

**Keywords:** Industrial development, information society, IT education, national IT plan, research funding

## **1 Introduction**

During the 1970s, there was a worldwide “waking up” to the increasing impact of computers in many strands of society. Computers transformed the technical fabric of organizations, and they were finally perceived to transform the workings of the whole society. The term “information society” was coined during this period. Information technology was seen as the central technology for increasing productivity, for providing competitive advantage to industry and for providing military might.

During the late 1970s and early 1980s, this gave rise to national research and development plans in most of the industrially developed world. For a long time the United States had a number of concerted efforts organized under the umbrella of defense. Japan organized a targeted effort to break the U.S. monopoly on

supercomputers and to apply artificial intelligence to further their already world leading automation industry – the so-called fifth generation program. The largest European nations (Germany, France and UK) followed suit and embarked on large national R&D programs that included support for their ailing computer industries. They were quickly followed by some of the technically advanced smaller nations in Europe such as The Netherlands, Sweden, and Denmark. On the European Community level, the ESPRIT program was organized during the early 1980s.

Initiatives appeared during the early 1980s to organize a similar national support program in Norway. Of importance was the “me, too” argument: all other comparable nations developed their IT competences on a broad scale; therefore, it had to be important, and unless Norway followed suit and invested in IT like the others, we risked falling behind as a society and could soon find ourselves on the garbage heaps of history. An opposing view was that “we are too small,” Norway cannot make any difference in the development of the new technology, “let’s wait and see” and apply the new technology when it has proven its value elsewhere, and – computers are just a temporary fad, all the fuss will soon be over.

The Norwegian national IT plan emerged as a compromise between many competing views: urgency versus “it’s a fad, we’re too small,” placing the main emphasis on industrial modernization versus main emphasis on supporting a rapid transformation of Norway into a post-industrial society. Common for all of the competing views and scenarios was a need for increasing the IT-competent workforce. There was wide agreement for increasing the number of IT-graduates, and consequently a wide agreement for increasing the country’s education capacity in information technology. Unfortunately, it was early when they decided not to establish a leadership having overall control of the program. The different ministries required the direct control of their own IT-budgets. This decision resulted in weak leadership and lack of coordination and overview.

The economic volume of the IT plan was determined during the post-mortem evaluation. The average total annual budget for the three-year period 1987–89 was 1,190 MNOK. This was an increase of 62 percent over the 1986 budget for comparable activities. Measured in “fresh money” this represents an increase over the 1986 budget of a total amount of 1,330 MNOK over the three years (445 MNOK/year). IT plan activities were budgeted also for 1990, as originally planned. The collapse of the IT plan in early 1990 makes it difficult to estimate the activity level, and I have therefore omitted 1990 from the comparisons.

The process of the making of the Norwegian plan has been well documented in Trond Buland’s doctoral thesis [1]. I was personally heavily involved both in the initiation phase and in the post mortem evaluation. In this paper, I explain some of the reasoning behind the choice of strategy in the initial phase, in particular as far as my own participation is concerned. I relied heavily on Buland’s thesis for those parts of the political processes where I did not participate personally.

## 2 The Political Landscape

The Norwegian IT plan emerged in a domestic political climate, which increasingly appreciated the importance of research and technology. The emerging information technology was seen as particularly important. It became the dominant view that change was coming, and as a country we had to prepare. Whether the feeling of change-is-in-the-air warranted special support actions from the government was another issue. By the mid-1980s, the attitude change had been completed. Enough political actors were ready to support technology-based innovation with targeted actions.

The political approach to industrial development was very traditional. They saw industry built on natural resources, capital and labor. The political left favored an interventionist approach of financing new industry, e.g., electronic industry, through public capital, and the political right favored a market-oriented approach. Much of the debate was concentrated on cost of labor and capital.

Neither the political left nor the right had much belief in the possible benefits of investing in research. Both sides were deeply influenced by traditional economic thinking. The political left favored a Keynesian approach to dealing with the economy. The political right trusted the market to stimulate the “right” research in “right” volume. The prevailing view among economists was that one could not find trustworthy correlations between investment in research and economic results for a country. The Norwegian political system was (and still is) heavily influenced by the economists’ worldview. Therefore, money for research was viewed more as luxury expenditure than as a factor for increasing the wealth of the country.

The lack of success of the political responses to the economic downturn during the 1970s showed that neither side could come up with a successful formula for turning the tides. Many saw the Norwegian industry increasingly consisting of sunset industries, which would not be able to pay high enough wages as the competition from the third world countries stiffened. This paved the way for other approaches. The lack of success in taming the economic storms of the late 1970s, the stagflation had weakened the influence of the traditionalists and it had strengthened the hand of the “industrial modernizers.” During the late 1970s and early 1980s, several government committees analyzed the emerging trends. The recommendations all pointed in the direction of stimulating technological development. This “game changer” was accepted over the complete political spectrum. Therefore, the scene was set for change.

Because of the recent discovery of North Sea petroleum, the Norwegian economy was in such a good shape that the new economic realities were seen later than in many other countries that were less lucky. Most of the other countries were already several years ahead of Norway in their search for remedies. Many of them had already singled out IT as one of the more promising avenues to industrial modernization. Therefore, it was no big surprise that IT became central also in the Norwegian debate. One may say that IT was destined to take a center stage position.

The political and bureaucratic establishments were short on IT-expertise. One important exception was one of the leading conservative politicians, Petter Thomassen. He came from a civilian job as leader of one of the larger regional computer centers of the 1970s. He had published a political debate book in 1980 about

data policy, in English translation the title was “Into the DATA-society” [4]. In retrospect, it seems clear that Petter Thomassen had a very constructive role in developing cross-political support for shaping the IT plan.

The cross-political support for the plan is also evidenced by the fact that there were two changes of government during the plan’s life. The initial planning was done under a center-right government, which was replaced by a center-left government in 1986, which in again was replaced by a center-right government after the general election in 1989. Petter Thomassen held central political positions during the whole period. He chaired the Parliament’s Finance Committee during the plan’s initiation phase in 1984–85, and he was Minister of Industry during the winter of 1985–86, and from early the autumn of 1989.

### **3 Phases**

Seen in the clarifying light of hindsight, the formation of the national IT plan had four distinct phases: initiation, institutionalization, implementation, and end game. The initiation phase consisted of several initiatives for establishing public support plans for using and developing the new technology. Several ministries proposed support actions for IT-research and IT-education, as well as for modernization in general within their own areas of responsibility. None of the proposals for increasing the general support to IT made it through the government budgeting process. During 1984–85, two new initiatives emerged; one came from a “group of concerned information technologists,” and one from the electronic, telecommunication, and automation industry. These two initiatives managed to form a coalition, which mustered wide enough support to bring them to a next phase of institutionalization of the proposal process, which finally produced a proposal that made it through the government budget process.

The institutionalization phase started with the merging of the two initial initiatives. The merging was organized by the government’s organization for public funding of technical and industrial research – NTNF. Additional proposals were brought into the planning process, e.g., the previously unsuccessful plans from the ministries. New actors brought into the debate wider societal concerns in addition to the more narrow industrial concerns of the initiation phase. Decision and budgeting for a national IT plan came as the result of political negotiations and harmonization of all of these additional concerns, amid a fierce opposition from the Ministry of Finance (“the Treasury”) who in every country is predetermined to oppose any new spending plan. The harmonization resulted in a relatively unfocused “open” plan. Many had contributed, but few of the contributors were given back much of substance.

The implementation was characterized by a “me, too” run for resources. All of a sudden, everybody was deeply involved in IT, and consequently had a right to compete for the relatively modest additional monetary resources that came with the national plan. The management of the IT plan was not able to resist the “stampede.” There was a continuous fight among the various stakeholders for controlling the direction and money flow of the IT plan. The national IT “plan” became a “plan by addition.” New items were added into the “plan,” the proponents hoping to get on the

list of worthy money-receivers. The “plan” ended in a way as a listing of a substantial part of Norwegian activity that included IT.

The end game started already in 1989, one year before the end of the IT plan. Labor lost the elections in 1989 to the center-right. We had a change of government philosophy from a “big government planning” to a “small government market driven” approach. The public and political support for the IT plan evaporated during the autumn of 1989, also deeply influenced by the deep crisis in the IT industry of the late 1980s. The minicomputer producers were out-competed by the emerging new players in the field, the PC producers headed by Microsoft. The support program that started in 1987 witnessed a collapse of major parts of Norwegian IT industry already in 1989. The political response was negative: the Norwegian IT plan had not worked. Conclusion: money down the drain, a total fiasco for Government intervention in affairs that should be left to the market. The Minister of Industry established a post mortem evaluation committee in January 1990, one year before the IT plan officially should come to an end [2].

#### **4 Initiation 1984–85**

The IT plan was first budgeted by the Government in 1987, which was made public early autumn of 1986. Prior to this, there had been a long process of establishing coalitions that had enough political power to release public money for a national support program of sufficient size. As is usual in these kinds of processes, there are different interests and different worldviews and these must be consolidated and harmonized through negotiations.

Three “networks” emerged during the initiation phase: one very informal “network” of Ministry bureaucrats, one formal and institutionalized network of electronic industries, and one informal and loose network of IT professionals.

The bureaucratic network was a loose and informal coalition of bureaucrats in several key ministries who agreed on the importance of information technology as a central force in shaping the post-industrial Norway – the information society. Many of the ministries had large IT stimulus programs in their own areas of responsibility, but there was no coordination among the many programs. The bureaucratic “network” was not in any way organized, and consisted of people who knew that they shared opinions about the importance of IT, and who were local drivers for modernization through IT within their own areas of bureaucratic responsibilities.

The industry network was organized by the interest organization of Norwegian electronics industries, EBF – Elektronikkindustriens Bransjeforening (in Norwegian). The leaders of EBF emerged as very active and forceful spokespersons for the modernization of Norwegian industry through increased application of IT.

The IT professionals’ network grew out of the Department of Computer Science (IDB – Institutt for Databehandling (in Norwegian) at the Norwegian Institute of Technology (NTH – Norges Tekniske Høgskole in Norwegian). NTH in 1996 became part of NTNU through a reorganization of the academic institutions in Trondheim.

Together with my good colleague Professor Reidar Conradi, I had a central role in the network of “concerned IT-professionals” as was the informal name of the network.

Much of the following describes how this network was formed and how it operated. For an extensive and “balanced” description, the reader is referred to Buland’s doctoral thesis [1].

#### **4.1 The Ministerial Support Plans**

Several of the different ministries had their own IT plans, in many cases plans of considerable size. The central ministries were for Industry, Education, Culture & Science, Administration & Consumer affairs, and for Communication. The latter was responsible for the telecommunication sector as well as for roads and railways.

IT-interested bureaucrats from these ministries produced a number of initiatives starting in the early 1980s, some of them successful, some of them not. The Ministry of Education initiated in 1984 a support program for increasing the use of IT in elementary and secondary schools. The Ministry of Communication worked with plans for modernizing Norwegian telecommunication. The Ministry for Administration was working with a national plan for IT and developed a first proposal in the autumn of 1984, a proposal that was presented for the other ministers early 1985. The proposal was for a program of 750 MNOK over six years with 350 MNOK for education, 300 MNOK for research, and 50 MNOK for public administration [1]. The Ministry for Industry worked through NTNF – The Norwegian Research Foundation for Technical and Natural Science research – to develop a plan for microelectronics research and innovation.

The activities of the various ministries lacked coordination. A first attempt to produce a coordinated proposal came in late 1984, when the Ministries for Industry, Communication, and Culture & Science (responsible for universities and research) produced a common proposal for an IT support plan of 300 MNOK over two years. There were two major items in the plan, one for supporting IT education and one for supporting IT research. In spite of all the good work done by the bureaucrats, concrete results were lacking in the government’s budget for 1986. Nevertheless, all of these proposals and programs together provided a fertile ground for developing a proposal for a national support program that could win a final political approval for the 1987 budget.

#### **4.2 Education: A Major Concern**

Organized education in IT started at the Norwegian universities during the early 1960s. Teaching was seen as a service for the established subjects. The teaching load was draconic, the research resources were slim, and IT gained in importance. At NTH we started in 1978 an IT specialist education, which became an instant hit with the students. The Computer Science Department (IDB = Institutt for Databehandling) had ten to twenty times as many applicants as we had available places. The industry was crying out for more and more graduates. There were, however, no signs that we would be given more resources by NTH. The situation was also very discouraging at the other universities. IT education was to a large degree seen as a “cash cow”,

bringing in money, but being used for research by the established academic disciplines, not for IT research.

At IDB, we became increasingly worried by the lack of relevant IT research in Norway. In most other technically developed countries large R&D programs for IT were underway. Unless Norway did similar investments, it stood the chance of being left behind, using yesterday's technology for solving tomorrow's challenges. At IDB, we tried to make the case for increased public investment in IT education and research both internally and externally, but to no effect. The internal budget fights at the universities made it very clear that it was unrealistic for a new discipline to "wrestle" enough money away from the established disciplines. Increasing the availability of external research resources seemed to be the only hope to survive "in style."

At IDB we came to the conclusion that our best chance was in trying to make available more public resources for the IT field as a whole, in the hope that some of the money would trickle down to us. In 1982, we decided to increase our efforts on the national political scene. This was to the dismay of the leadership at NTH, but we decided to go ahead in spite of that. We had lost belief in NTH's willingness to support us in our efforts to find more resources for IT as a discipline. NTH was willing and able to support increased resources for IT as a support for already existing disciplines, but there was much internal opposition to expand the resource frames for the discipline itself.

### **4.3 "The Group of Interested Information Technologists"**

There was no hope that on our own we could make available enough money, neither for our local needs nor for what we thought that the country ought to have for IT R&D. We needed powerful allies. The obvious candidates were the companies who could not find enough IT-graduates. The discrepancy between demand and supply of IT graduates could be observed in the late 1970s, to become severe around 1984–85. Industry complained that the lack of enough graduates inhibited their growth and undermined their competitive positions. For the university, having the IDB department team up with industry was a perfect win-win situation. The objective was clear: to organize a government sponsored IT plan for investment in R&D, comparable to those of other countries.

The first step was to investigate whether there was any chance of broad support for an initiative in this direction. The idea was favorably received when we presented it at a panel debate in Trondheim early 1984. We developed a sketch for an investment plan of around 400 MNOK/year over three to five years. I wrote a letter to Petter Thomassen, who I knew professionally, and who at the time chaired the Parliament's Finance committee, enquiring whether he thought that the idea had a chance of surviving politically. He encouraged me to continue with the initiative, indicated that 400 MNOK/year was a lot of money, and gave me the good advice of thinking about those who we would have to recruit in order to get political support for finding the money. The sketch was developed during the next months, and this first plan was (somewhat humorous) called DATAKUP – skisse til nasjonalt KunnskapsUtviklingsProgram i DATAteknikk (English: sketch of a national knowledge development program in data technique).



The next step was to form a group of likeminded people who were in positions to influence the wider technological and industrial environment. Based on the DATAKUP sketch, we (at IDB) took an initiative to form an informal “Gruppe av interesserte informasjonsteknologer” (English: Group of interested information technologists). The group was established in June of 1984 and it consisted of ten persons, including myself as its informal chair, and my good colleague at IDB, Assoc. Prof. Reidar Conradi who served as the group’s secretary. The members of the group were leaders of central IT-companies and of the IT operations of some of our largest companies.

The group further developed the original sketch into a DATAKUP plan of 800–1,200 MNOK over three to five years, strongly profiled towards knowledge development, for education and industry, in a “technology-push” fashion.

#### **4.4 STRAPIT – the Electronic Industry’s Plan**

The Norwegian electronic industry faced a similar situation as we did at the universities. Their foreign competitors enjoyed large infusions of public money for IT research and development. The lack of similar funds from Norway was a threat to their survival. Norway had at the time several domestic IT equipment producers who enjoyed commercial success, e.g., Tandberg Data produced computer terminals and Norsk Data had been very successful with their mini-computers.

The electronic industry was small, counting only 13,000 working places, and was vulnerable, and might not be able to follow up on the rapid technological changes of the times. The CEO of Tandberg Data, Ralph Høibakk, was chair of EBF (the interest organization for the electronic industry), and launched a planning process for the future of the industry. The initiative was called STRAPIT – Strategic Plan for Norwegian IT industry towards year 2000 [2]. The final proposal had a volume of 2,800 MNOK over five years. It was primarily an innovation plan for the electronic industry and was based on a market-pull philosophy.

The EBF chair Ralph Høibakk agreed to be a member of “the group of interested information technologists,” together with the then chair of EBF’s research committee, Helge Christensen. They were also members of the STRAPIT board. The personal overlap between the two groups secured that the DATAKUP and STRAPIT initiatives were kept on track, and supported each other rather than competed. The two initiatives found a natural separation of tasks. DATAKUP concentrated on basic research and education, and STRAPIT concentrated on industrial issues, both for the IT industry and for the wider Norwegian industry as users of IT.

One item of the STRAPIT report was concerned with forecasting the future size of the electronic industry segment in Norway. Three different scenarios were painted, one of low growth, one of medium growth and one of high growth. These numbers were to play a decisive role in the following political struggle, which was leading up to the decision on whether to form a national IT plan.

The two groups presented their reports during the summer of 1985. The scene was set for the next part of the initiation phase, the institutionalization, which was leading up to the political decision.

## 5 Institutionalization 1985–86

It was clear to everybody involved with DATAKUP and STRAPIT that NTNf had to play the major role in transforming the two initiatives into one plan, which had sufficient industrial and political backing. Late spring/early summer 1985, prior to the publishing of the DATAKUP report, I contacted the new Director of NTNf. He was the retiring rector of NTH, professor of Electrical Engineering at NTH and familiar with the electronic industry and telecommunication. In the preceding years, I had much to do with him on the reorganization of the IT education at NTH. I proposed that he should take the DATAKUP and STRAPIT initiatives, merge them into one NTNf initiative, and present a proposal to the political establishment. He immediately saw both the needs of the country, and the possibilities for giving NTNf a leading role in the implementation of a national IT plan.

The traditional role of NTNf was to handle industrial research and innovation on behalf of the Minister of Industry. The ministry and NTNf worked closely together. NTNf established a group of six representative persons to merge the existing proposals into a common plan for NTNf to propose to the Minister of Industry. The group was chaired by Reidar Kuvås, who was a central person in Norwegian electronic research and industry, and was an “NTNF-insider.” Three others (including the secretary Helge Kildal) had been deeply involved with STRAPIT. Then there was the CTO of the Norwegian Tele-monopoly (Televerket), and I, who represented the “Group of interested IT-technologists.” The technical-industrial bias was undisputable.

The NTNf group was established in February 1985 and delivered its proposal in May 1985 after only three months of work. It was easy to agree within the group on the main elements of the proposal, which consisted of five sub-programs for Education, Equipment procurement, Knowledge development, Product development, Applications & Dissemination. It was a plan for industrial modernization.

It soon became very clear that a single Ministry was not strong enough to win a budgetary fight with the Ministry of Finance on a proposal, which required “fresh money”. The economists in the Ministry of Finance did not believe that investment in technological research was worth the money. A broader alliance of Ministries was necessary in order to overcome the resistance from the ministry of Finance, and find “fresh” money. The industry political perspective was too narrow for finding sufficient support. A wider perspective of bringing the whole society into the information age was necessary in order to forge a strong enough alliance. The vision of “the information society” subsumed the vision of “industrial modernization.”

In the course of the next five to six weeks after the NTNf plan was proposed, the “bureaucratic network” managed to work out a sketch for a four-year plan, which was supported by five ministries, and which was presented to the government’s budget conference at the end of June 1985. The proposal contained the five subprograms of the NTNf proposal; but it had widened its rationale enough to get the support of all five ministries in a plan, which still was focused on industrial modernization.

The vision of “the information society” brought new actors into the negotiations, and increased the budget dimensions of the proposals to levels beyond what was possible. The Ministry of Finance was very clear in demanding that no “fresh money” should be given, and that an IT plan would have to be constructed within the ordinary

budget frames of the participating ministries. During the spring of 1986 the fight among the different ministries for the directions of the programs, and for the “fresh money” for the furthering of the different causes, brought little progress in the planning. Nothing much happened over the winter, to the increasing frustration of the people behind the two main initiatives, DATAKUP and STRAPIT.

At NTH we were disappointed with the lack of tempo. We tried in vain to re-awake our network of “Interested information technologists.” I had been contacted by NTNF after the NTNF report and requested whether I wanted a role in the next phase. I had declined. The indications were that an IT plan would become reality. I saw an important role for NTH in IT education and research, and wanted to be on the receiving side of the money flow. I now regretted that I had not chosen to have a more active role. Whether this would have had any positive effect is, however, more than doubtful when judging the powerful political forces that were in play.

The center-right government was replaced by a center-left government in May of 1986. The new government was positive to motivated politically support programs for selected industrial sectors, while the center-right was generally skeptical to such exercises. The new Minister of Industry took immediately initiative to continue and speed up the planning process. The deadline for having a proposal for the 1987 budget was approaching. Three issues were of particular importance for shaping a winning coalition during the next months: job creation in the electronic industry, regional policy, and the organization of the IT plan activities. The Ministry of Finance had not given up on their defense of the nation’s treasure chest, and strengthening of the pro-plan coalition was necessary.

STRAPIT had done three calculations of the size of the electronic industry measured in new jobs, for low growth, medium and strong growth. It was estimated that the strong growth scenario would create 60,000 new jobs within the next fifteen years. These 60,000 new jobs became a concrete goal in the political debate, and “against 60,000 new jobs even a Ministry of Finance will fight in vain” [1, p. 249].

During the summer of 1986, the various Ministries were asked to report which IT-activities they would propose as part of a national IT plan. The Ministry for Districts and Labour (in Norwegian: Kommunal- og Arbeidsdepartementet) worked out an overview of activities where IT could play a role. Those were many. From that point in time, also regional policy started to play a role in the formation of the national IT plan.

The organization question was a tricky one. There were two opposing views. The industrialists’ view was to organize the activities as a project with a strong leadership, which should report to the Minister of Industry. The opposing view was that the different ministries should take responsibility for their own budget items, and that a coordination group with limited power should be established. There was wide agreement that it was not desirable to establish a new government agency, and that the existing organizational apparatus should be used. The compromise was to establish a secretariat in NTNF, which reported directly to the Minister of Industry. None of the other ministries was willing to hand over money and control of their own IT activities to the Minister of Industry. The compromise was necessary in order to secure the support of all involved ministries.

After the political negotiations during the autumn the NTNF proposal’s original five subprograms had been extended with three new subprograms, one for

telecommunication research within the existing publicly owned telecommunication monopoly (Televerket), one for establishing regional competence centers, and one for increasing in-house industrial research financed by the industry. The four-year plan had become reality. The proposal for “fresh money” in the 1987 budget was 300 MNOK.

## **6 Implementation 1987–90**

The IT plan was in for a bumpy ride. It was not a “plan” in the conventional meaning of the word. It consisted of a number of individual plans. Each individual plan was budgeted and controlled by different ministries. The IT plan was the addition of all of the “sub-plans”. There was no overriding idea that went beyond visionary statements about the future “information society”. There was no overriding strategy, no concrete goals and for the plan as a whole, and no organizational instruments for forging decisions on the sub-plans on how the money should be used. The various ministries did not lightly give up their budgetary control over the activities for which they were responsible.

The first coordination group (Norwegian: Nasjonal Styringsgruppe for Informasjonsteknologi) had a dual responsibility. It advised the Minister of Industry on the whole IT plan, and had the operational responsibility for the IT-research budget of NTNf. The group lasted only a little over one year; it was replaced in March 1988 by a new coordination group called NUIT (Norwegian: Nasjonalt Utvalg for Informasjonsteknologi). NUIT was organized directly under the Minister of Industry. NTNf’s money remained in NTNf. The various Ministries’ money remained in the Ministries. NUIT emerged as a lightweight coordination committee without own resources. NUIT lasted only for approximately one year and a half. Starting January 1, 1990, the coordination responsibility was given back to NTNf where it remained until the official end of the plan in December 1990.

Each of the sub-plans functioned, and planned work was performed according to plans. The major deficiency was that there was little or no synergy. The overall results of the efforts did not become larger than the sum of the components. The fresh money was not put to use in a planned way following an overall strategy. The first coordination group started to develop a strategy half a year out in the IT plan, by early autumn 1987. The Minister of Industry became increasingly impatient, replaced the group by NUIT who restarted the strategy work. By mid-1988, there was still no strategy.

The IT plan had a high political profile. The media interest was also high. As the general election of 1989 came closer, the political pressure intensified for showing concrete results. The “promised” 60,000 new jobs still existed in the political landscape, and they did not materialize during the second year after the plan was initiated! The center-left lost the 1989-election and the IT plan was doomed.

## **7 End Game 1989–90**

The end game started shortly after the new center-right government took over after the general election of the autumn of 1989. The pressure for an evaluation of the IT plan was strong. Petter Thomassen was back as Minister of Industry. I contacted him and asked that I became member of the evaluation committee. This was granted. The evaluation committee was established by government decision on January 12, 1990, and delivered its report on June 1, 1990.

The post-mortem reconstruction of the IT plan classified the activities into five major activity areas: for education (18 percent), equipment (11.5 percent), research (8.5 percent), product development (15 percent), and applications (47 percent); the numbers indicating the part of the total budget allotted to the activity area (NÆR90). The financing that followed the IT plan was to provide a continuation and strengthening of ongoing efforts within all of these broad activity areas.

The strengthening of activities was unevenly distributed over the five activity areas. The average annual budget increases compared to the 1986-level were allotted to education (57 percent), equipment (107 percent), research (2 percent), product development (52 percent), and applications (80 percent). From these numbers it is evident that the application area had more than 50 percent of the “fresh money,” trailed by education (18 percent), equipment (16 percent), and product development (13.5 percent). Research was the big loser, and got nothing (0.5 percent). Compared to the annual inflation rate the research area lost ground and came out worse after the national IT plan than before this substantial national investment in information technology.

One should be careful when evaluating these numbers. Some of the activity areas were headed for substantial budget increases already before the IT plan was initiated. Much of the increased activity in the application area would have happened anyway, independently of having an IT plan or not, although not as fast without the IT plan as with the plan. However, for the most part, the increased activity in education and product development would not have happened without the IT plan.

The Norwegian IT plan was comparable to other countries' IT plans, measured in budget per capita for comparable activities.

## **8 Concluding Remarks**

In the aftermath of the IT plan, the field of IT was dead as a political subject for the next six to eight years, until the start of the dot.com wave. There were many bloody bureaucratic noses in the various Ministries. As seen from the outside, the government bureaucrats seemed to do their best to forget the whole “episode.” IT became invisible. The effect of this is felt to this day. The political interest in IT evaporated after the national IT plan, never to have been revived other than in political rhetoric.

One area that received substantial new resources was IT university education. Fortunately, the positive effects of financing an expansion of the university education for IT-specialists may have made the IT plan “exercise” worthwhile. This led to

Norway having many competent persons for the next big wave in IT, the internet revolution that set in during the 1990s.

The IT plan had a wider political fall-out. The evaluation report contributed to an ongoing debate about the “segmented” state. A widely supported view was that the segmentation brought about by the internal organization of the government bureaucracy prevented “holistic” planning. The IT plan provided a relevant case study. The basis for the plan was a general technology which had potential for changing every segment of society, and indeed has done so from 1970 and onwards. The IT plan was an obvious case for cooperation among the different “segments” of society. Even so, that did not happen. The conservation forces were too strong. Buland (BUL96) proposes that the fate of the IT plan was an important argument for the restructuring in 1994 of the Norwegian publicly funded research organizations. Norway had a large number of research financing agencies for, e.g., industry (NTNF), basic research (NAVF), food, fisheries, and so on. They were all merged into one organization, NFR – Norges Forskningsråd.

However, nothing had been done with the ministerial “fiefdoms.” To this day (2010), the various ministries control their own research budgets for IT and they provide NFR with money that has many strings attached. These “many strings” prevent synergy in the sense that several ministries can easily agree on financing IT research of common interest.

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