Experiences from national IT-projects – How can it be done in a better way?

Report and recommendations from a work group working under the auspices of the Danish Board of Technology

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Foreword

In the year 2000, the Danish Board of Technology resolved to gather together experiences from a number of large-scale public IT-projects and to assess common problems that the projects had run up against. Problems that served to occasion delays in the IT-systems, make them more expensive than originally planned and also, in several cases, frustrated expectations with respect to their practical value.

The present report sets forth the results of this work. At the same time, it offers a series of recommendations about how people in the public-sector can get a grip on coming IT-projects. These recommendations are addressed to the government and the legislature as well as to those people who are making decisions in the sphere of public administration, those who will be assuming the responsibility for large-scale IT-projects in the future.

The report has been prepared by a work group working under the auspices of the Danish Board of Technology. A number of people, who all possess some degree of special insight into ways of articulating the problems – largely on account of their own personal experiences with IT-projects in the public-sector – were chosen as members of the work group. The work group consisted of:

Erik Bonnerup (Chairperson)

Annelone Jensen, Fulfillment Manager, eHuset (appointed by Dansk Dataforening)

Birgitte Gregersen, Associate Professor, Department of Business Studies, Aalborg University

Erik Andreasen, First Vice President, Den Danske Bank

Hans Henrik Østergaard, Managing Director, Financial Administration Agency

Inge Mærkedahl, Director General, The Danish School of Administration

Karsten Dybvad, Permanent Secretary, Ministry of Traffic

Kim Viborg Andersen, Associate Professor, Copenhagen Business School

Kim Østrup, Deputy Director, IBM

Martin Toft Hansen, Managing Director, CSC Scandihealth (appointed by IT-Trade Organization)

Nina Esmark, Executive Project Manager, IBM

The Danish Board of Technology has made its secretariat available for serving the needs of the work group.

The work group's own knowledge has been supplemented with almost 30 interviews with involved players in five large-scale public IT-projects. Moreover, during the course of making its investigation, the work group hosted a workshop for a circle of concerned professionals.

Both the Danish Board of Technology and the work group wish to thank everybody who has contributed to this project along the way. Our gratitude is directed especially to the many interviewed persons who have made their knowledge and their experience available to us. The responsibility for the final report, of course, rests exclusively on the shoulders of the work group.

The Danish Board of Technology, March 2001
Lars Frelle-Petersen, Project Manager

Introduction

The point of departure for this report is the view that the public-sector must not squander its chances of utilizing information technology (IT) for achieving an improved and more effective supervision, case-consultancy and service. For example, by choosing to develop IT-systems where such advantages are not exploited fully enough. Or by completely failing to set its stakes ambitiously enough on information technology. This would have far more serious consequences than the rather uncomfortable delays and budget overrides that have marked a number of IT-projects in the public-sector in the nineties.

It is precisely the risk that the development of IT in the public-sector will lose its momentum that constitutes what is possibly the most serious consequence of recent years' problem-filled IT-projects and the public criticisms they have aroused. One part of the purpose with this report, then, is to point out a number of common reasons why the projects have failed to achieve their goals. The aim here is to focus on what initiatives can be taken in order to engender a better progression in the project.

No one can guarantee a "scandal-free future". Large-scale IT-development projects are too dynamic and too complex for that. It is impossible to predict and control all the circumstances that can knock a project off its course. Hopefully, the present report will contribute toward preventing that scandal which arises from neglecting to learn from the mistakes of the past and hopefully to make good use of the positive experiences which, in spite of everything, are found in plentiful supply.

Purpose and target group

This report is addressed especially to politicians and administrative decision-makers in the public-sector. Its chief aims are to systemize experiences from a number of large-scale public IT-projects and to combine these with the work group's members' own experiences and, finally, against this backdrop, to put forth recommendations for future practice. From the outset, the work group's point of departure has been that the report's analysis and recommendations ought to:

- **Move across individual projects:** This report presents general problems and experiences from five IT-projects that display a wide spectrum of mutual diversity. The conclusions in the report, therefore, are not meant to cover comprehensively any one of the five model projects but aim, rather, at delineating a picture of the problems that appear to be *typical* of the five projects as a whole.

- **Concentrate themselves around the projects' problems:** There have been many successful elements in the projects that are under examination here. And several projects have tackled the problems that arose along the way in a most professional manner. What the work group has regarded as its assignment, however, is to deal with the less successful aspects of the projects. For this reason, the public IT-projects are exposed here to the risk of appearing in a more *one-sided* negative light than what they generally deserve.

- **Face the future:** The aim has been to identify the experiences that others can learn from. In this report, there has been no attempt to map out and elucidate all of the problems in the IT-projects. And it lies far outside the scope of the present project's task, methods or resources to go about assigning responsibility to any particular protagonist for the individual project's problems.

- **Focus on strategic challenges:** Large-scale public-sector IT-projects contain challenges on all levels – from the political decision-making process to the everyday running of the operations - and often, the boundaries between these levels are diffluent. The report focuses on a number of these challenges, especially those that are connected with the strategic level. Among other things, these subsume the projects' outline-conditions, the public authority's organization and the interplay between buyer, purveyor and consultants. Gathered together in appendix 1, there are a number of more operational recommendations for good practice before, during and after an IT-development project.

This report does not presume to be a handbook in project management or a bulletproof shield against those problems that will inevitably arise along the way in the course of an IT-project. It should be regarded as an overview of the points which, as a minimum, ought to be set on the agenda before an IT-project is put into motion, as the system is being developed and when it is put into operation.

Delimitation and method

The report's conclusions are constructed in part on the foundation of the work group's personal experiences and in part on an interview investigation into five cases which are described in greater detail in appendix 2:

- **Amanda** – The unemployment office's integrated registration-, activation- and economy-system. A contract was signed in 1996. According to the plan, the system was slated to be ready for use on January 1, 1998. It was first put into operation, however, on April 10, 2000.

- **EASY** – The ministry of education's computer-system provides all of the trade schools with a common administrative and economic system. The system was offered in 1995 and was put into use in 1998/1999.

- **Erhvervssystemet [The Business System]** – The computer system of the Told og Skat **[Custom and Tax Authority]** was supposed to register information about business enterprises concerning taxes and duties. A contract was signed in 1995. According to the plan, the system was to be put into operation in June 1997. In the spring of 1997, however, it appeared that four of the system's five parts could not be supplied. The fifth part of the system was finally put into operation in the year 2000.

- **Navision Stat** – The **Agency for Governmental Management** is the body behind a standardized fiscal system that was to be installed in approximately 400 national institutions. The implementation started in 1999 and will continue for another three to five years.

- **VUE** – "Videregående Uddannelsers Edb" [higher-learning institutional computer systems], VUE, is an integrated information system. The project was initiated within the Ministry of Education in 1989. The system was slated to be ready in 1994. The first institutions were able to make some use of it in 1996. It was finally ready in 1999 and even today, only some of the institutions are using the system.

These five projects have been selected from a number of other possible candidates. The criteria for the choice of each project has been based on the fact that they each possessed a certain size with respect to price, number of users, time-expiration and potential significance for the buyers' organization. Moreover, it has been presupposed that the public-sector organizations would be interested in participating in the investigation, thereby making it relatively easy to gain access to information about the project and to be in contact with the involved players.

The five chosen cases are all large-scale IT-projects in the sense that the assignments that they are supposed to support possess a decisive significance for an entire sphere of administration. In a fiscal respect, the projects' original budgets range from around 25 million (EASY) to 268 million DKK (Amanda).

What have also been aimed at here are reciprocal differences in the spread of projects. This entails, among other things, that the report will encompass successful and less successful projects; older and newer projects; projects financed on the basis of funds generated from internal operations; projects financed through independent cases presented before the Finance Committee; and finally, projects that have built from the ground up and projects that have been adapted into standard systems.

In all five projects, the buyer was a national institution. In this report, accordingly, experiences and recommendations are grounded primarily in nationally related projects. But a long line of problems would be equally relevant to the counties and municipalities that are working with large-scale IT-development projects.

In each case, around five - as an average – key persons have been interviewed: the public-sector buyer, the purveyors and the consultants who have taken part in the project. The interviewed individuals have been asked to express themselves freely and their anonymity is protected. The aim here has been to surround the participants with the freedom to articulate themselves both critically and self-critically about the projects. To a great degree, this is reflected in the results. The anonymity entails that it is not possible for the report's readers to address themselves to the various parties' personal accounts of the course of the projects. This situation also underscores that the report cannot be used to judge the mistakes in an individual project.

The work group has not gone into depth with the individual projects' technological quality, for example, with questions about choice of platform, system architecture, functionality or userbility. This is partly due to the fact that, technologically speaking, the similarity between the projects is very limited and partly because such an analysis which might get to the bottom of the projects' technical problems would require far greater resources than have been made available to the work group. For such a purpose, the public-sector is better served by that kind of investigation that has been carried out in the so-called "sage report" about the Amanda system.

A sharpened focus on the field
The present report is the first large-scale Danish analysis that runs transverse to a number of large-scale public-sector IT-projects and the involved parties and builds upon independent, empirical investigations of the projects. From several different vantage points over the course of the last few years, there has been a focus on public IT-projects. Among other things, we have seen:

- **The National Audit Office: "Report to the national auditors about the implementation of national-scale computer projects"**
- **Danish Data Association: "10 Dogmas for Public IT-projects" and "5 attitudes toward Public-sector IT-projects"**
- **PLS Rambøll Management: "IT in Practice 2000"**
- **Report from an expert group concerning the national unemployment office's computer system: Amanda.**

From its own respective vantage points, each of the aforementioned reports has managed to cast light on some of the problems in the field. Our work group has not addressed itself directly to the conclusions presented in these reports. We have merely ascertained, however, that with respect to a number of cruci-

al points there indeed appears to be some degree of congruence in perspectives and suggestions. The same thing can also be said about the results that appear in studies of experiences from public IT-projects in countries like England, Sweden and Norway. In the literature list at the end of the present report, the reader is referred to a number of Danish and foreign publications.

During the period contemporaneous with this study project, the government has taken a number of initiatives in the field. It has set up the National IT-Advisory Board and the IT-Forum, where leading government officials are charged with the task of gathering up both positive and negative experiences from public-sector IT-projects. In the autumn of 2000, in connection with the preparation of the annual budget for year 2001, the government pledged to:

- **assess whether there is a need for adjusting the rules for appropriations in such a way that regulations concerning the risk-assessment of a project be firmly established before it is presented to the Finance Committee.**
- **assess whether the presently existing standard contracts are sufficiently appropriate to IT-projects and elaborate new and more flexible models for offering and contracting of system development projects,**
- **create a guide to "best practice" with respect to the management of national development projects and offer advice from professionally qualified colleagues to government ministries that are currently faced with new development assignments.**

The work group has kept up to date with respect to these initiatives and a number of the report's recommendations are directed specifically at these efforts.

The construction of the report

The report is divided into four chapters. Each chapter is prefaced with a concise synopsis. Chapters 2, 3 and 4 conclude with the work group's recommendations.

Chapter 1 offers a brief description of how the inter-relationship between technological development and the demands placed on the public administration, as assessed by the work group, will come to bear on and influence circumstances surrounding public-sector IT-projects. Among other things, the chapter sets its focus on the need for digital administration, that is to say for a sweeping digitalization of the public-sector. What are sketched out here are the requirements this development will pose on the technological infrastructure and especially on the transformation of the public administration. IT-systems of the future will require, among other things, a much stronger collaboration that runs transverse to the presently existing boundaries in the public-sector – with the ensuing requirements posed on the sector's political and administrative management.

Chapter 2 reviews the political, juridical and administrative outline-conditions which are common to all public IT-projects and which, on a number of points, differentiate them from similar projects in the private sphere. Among other things, this involves the choice of technological solution-models, the political decision-making and appropriations processes, the cooperation between ministries, the interpretation of the EU's offerings-regulations, the existing standard contracts and finally, the special opportunity for public insight into the projects. The chapter will also investigate the degree to which these special frames can serve to elucidate problems in the public-sector projects and will point out possibilities for altering the frames, or for making better use of them.

Chapter 3 treats of the large constituent elements comprising the problems in the investigated IT-projects that are due to internal relations in the public-sector buyer's organization. A critical eye is turned toward how the projects have been apprehended, prioritized and managed. Among the questions that are illuminated here are the role of management, the deficiency of strategic goals for the projects, the maturation of the buyer's organization and finally, a whole sequence of more specific problems associated with the management of the project's expiration. The chapter demonstrates that the public-sector organizations have generally not been mature enough to carry through such large-scale projects in a sufficiently professional way.

Chapter 4 identifies the problems that are connected with purveyors and the consultants' role in - and contribution to - the projects. Among other things, a question mark is set beside whether these professional parties have exerted enough efforts in warning about and preventing the problems that the projects ran into. The chapter also deals with the interaction between buyer, purveyor and consultant. This applies partly to the rather stringent contract control of the projects and partly to the public-sector's relatively uncritical use of private consultants.

Appendix 1 sets up, in a schematic way, a series of good tips for the practical implementation of IT-projects. The appendix has been arranged as a checklist for the management that is invested with the over-riding responsibility for a project.

Appendix 2 sets forth a concise description of the most important factual details surrounding each of the five case study IT-projects that the work group has reviewed and analyzed.

New demands on IT in the public-sector

1.1 Synopsis

For a long period of time, the public-sector in Denmark has been able to make use of information technology in a way that is relatively advanced when compared to conditions in many other countries. Among other reasons, this has been possible because, at a relatively early point in time, the Danish society implemented a single-valued identification of each and every individual citizen via the means of the CPR-number [central person-register] and of the individual businesses via the SE-number [VAT reg. no.].

If Denmark is to continue standing in the fore-front with respect to using IT for solving public tasks, then a number of fundamental and partly new preconditions are going to have to be made more explicit to the political and administrative management in the public-sector.

First, the citizens will demand an IT-based service from the public-sector that is, at the very least, on a level with what they will experience from the most advanced private enterprises. Among other things, this means to say easy and secure access to being able to communicate, submit reports, order, make payments and obtain specific and precise information over the Internet.

Second, in coming IT-projects, it must not be the technology that defines the boundaries for what public tasks can be implemented electronically. The most important barrier for new projects will be the public-sector's own capacity for realizing technological potentials.

Third, the need for IT-systems in the future will move transverse to the existing administrative entities and consequently require that the public-sector coordinate its activities in a far more effective way than is the case today.

Everything else being equal, this means that the problems with the nineties' IT projects which are being described in this report will become amplified in the projects of tomorrow. Therefore, it is imperative that the effort to avoid or minimize these problems be accordingly intensified and this poses greater demands, especially, on the top levels of political and administrative management.

This chapter briefly describes what challenges IT-development poses on the public administration. However, the aim here is not to describe the technology's possibilities in greater detail or in the long-term view. The emphasis is placed rather on illustrating what IT-development demands of the public administration, whose technology has to be exploited for solving entirely new and far more complicated public tasks.

1.2 Technological and administrative development

The development and application of administrative IT-systems in the public-sector have changed in character and expanded very drastically in the course of recent decades. The first larger systems were introduced at the end of the 1950s and in the 1960s. They were primarily employed for purposes of rendering well-known routines connected to the handling of large quantities of data automatic – including the calculation and registration of data. Such tasks typically involved salaries, bookkeeping and taxes.

The technological solutions were based on central systems. It wasn't until later on that there was access to the centrally registered data through the means of terminals. Until the middle of the 1980s, all of the large IT-development assignments in the government, by and large, were attended to by the Data Central, which also assumed responsibility for running the systems.

Technologically speaking, what has taken place is an increasingly accelerating evolution of hardware as well as software. The capacity for storing, handling and transferring data – even in extremely immense quantities (including pictures) – no longer poses any impediment to the desired job solution – neither technologically nor economically. Technology has also removed the limitations in the physical placement of future systems.

In IT-projects of the future, in other words, it will not be the technology that stipulates the boundaries for which public assignments are to be solved or supported electronically through digital networks. The limitations will be situated primarily in the public-sector's capacity to implement the projects and the requisite large-scale transformations that will be imposed in order to achieve the economic and service-related benefits to be derived from the investments. Those demands placed on the public organization which already constitute the prerequisite for carrying out successful projects today will come to be further intensified.

Organizationally speaking, what was typically going on previously was an automation of well-known work routines and relatively straightforward efficiency engineering, involving nothing more than easily accomplished readjustments and cutbacks in limited parts of the organization. IT-projects of the last few years, however, move transversely across

the entire organization, in a very different way, and typically presuppose profound readjustments and adaptations of the organization.

In certain areas, the future of IT-application in the public-sector can be compared with the development in the financial sector. Here, we also find enormous quantities of data, a complicated "set of rules" and crucial demands on the systems' security, accessibility and credibility. The financial sector has implemented large-scale efficiency engineering and improvements in services. At the same time, the customers' use of the bank's network of local branch offices has to a wide extent come to be superseded by payment systems, credit cards, telephone service and transactions over the Internet. This development is already underway in several places in the public-sector – for example, in the area of taxes and salary reports. And what can be expected in the coming years is an ever increasing pressure to carry out this transformation in new areas. Partly because there will be great societal-economic advantages in moving in this direction. Partly because the citizens will be demanding the same IT-solutions and improvements in the public-sector which they are accustomed to in other areas and which they therefore know are feasible. However, it's going to demand a far greater degree of interdisciplinary coordination if the citizens are going to be provided with the possibility of reporting information - and being able to do this only once!

1.3 Expectations of service in the public-sector

In the future, citizens and business concerns will make demands on obtaining precisely those bits of information from the public-sector that are relevant to their needs, and that these be made available in an easily accessible way. They will also be expecting that they can settle up their accounts with the public-sector via the Internet. In practice, what this will entail is that the dialogue between citizen and the authorities will be structured according to "events" – such as birth, change of residence and marriage. The authorities' bits of information provided to – and dialogue with – the citizens can then be adapted to the current needs. Citizens and enterprises will typically be indifferent about which agency supplies the relevant pieces of information, as long as they can obtain these bits quickly and precisely.

Specifically, citizens and enterprises will be expecting, for example:

- to have direct access to communicating electronically with their "case worker" and to be able to update themselves continually on the status of the pertinent matter.
- to be enabled to report bits of information over the Internet and that these bits of information will be reported all at once.
- to be able to make use of so-called "intelligent

forms", which will go and 'fetch' the requisite and accessible items of information and transmit them further to one or more relevant authorities.
- that a considerable part of the case consultancy can transpire automatically – for example, via different kinds of electronic decision-making systems.
- that public agencies will possess an extensive – albeit regulated – access to each other's information flowing across organizational boundaries.
- to be able to transact all payments to be made to the public authorities over the Internet.
- to be able to gain access to information about their own personal data.

For each and every public institution or authority, what these expectations entail is that in the course of just a few years, each entity will have to be in a position:

- to publicize itself on the Internet and make information about itself available in an easily accessible way.
- to carry out digital case consultancy and moreover, to be able to respond digitally to all inquiries.
- to "save", digitally.
- to make self-service systems available.
- to get the IT-systems to connect up with the respective administrative tasks that deal with groups such as students, patients, immigrants and parents of young children.
- to shop over the Internet, in such a way that the purchases will be interlinked with economic systems. It will be imperative that the public-sector, across a wide front, be able to avail itself of purchasing portals, which will be integrated into the other administrative systems.

Some part of these possibilities has already been realized within the individual case areas and in certain administrative sectors. But there is still a very long way to go before they will come to be fully implemented across the various administrations.

1.4 New demands on the public-sector management

It would seem to be natural that the government's very clear declaration that Denmark ought to be a leading nation in the IT-field be manifest in specific initiatives within the public-sector. An obvious example of both possibilities and challenges can be seen in the health sector. Here, a cooperative exploitation of the technological possibilities for making an aggregate registration of patient data would certainly result in a better treatment of the patients, improved services and considerable savings. However, this demands that there also be some degree of political accord about such an aggregate solution and about how to line up the forces to get it rolling.

In the private sector, there are numerous examples of how the many items of information in the IT-

systems are utilized for supervision- and management- purposes. This frequently transpires across the dividing line of various administrative systems. For example, by building up a so-called data-warehouse, where relevant data is stored so that it can quickly be combined and worked over in new ways. This might involve, for example, illuminating the business-related development in different areas and following up the developmental tendencies, etc.

In an analogous way, IT-systems in the public-sector will provide both the political and administrative management with the possibility of being able to assess the development in the public-sector in a much faster and more precise way than is possible today. For example, with the possibility of following up the consequences of revised legislation. However, this will demand once again that requirements with respect to coordination and cooperation be set up transverse to presently existing administrative divisions.

The required investments in the technological infrastructure will, moreover, be followed up by investments in organizational development and human resources. What needs to be developed, then, is competence – the competence to implement the necessary IT-stakes and the competence to make use of their results. It will not be possible to realize such a thorough configuration without a systematic higher or post-graduate training of the leaders and the personnel in the public administration.

The need to fortify the administration's IT-competence applies to the capacity to implement and to lead IT-projects, a capacity that is connected to professional competence, as well as the capacity to exploit and utilize the system's possibilities at the 'user' level. What is involved here, among other things, is research into how IT can be integrated into the organization and how it can support a professional case consultancy – often in interaction with competent citizens.

When it comes to the future's large-scale IT-projects in the public-sector, three main conclusions can be drawn about the tendencies that have been sketched out in this chapter:

- First, over the course of the next few years, we can expect that both the need and the technological potential for large-scale IT-projects in the public-sector will be rising dramatically.

- Second, organizationally speaking, the IT-projects will become more complex, because to a significant extent, they move across existing dividing lines and institutions in the public-sector – and on this account, they will also be posing a challenge to these very structures.

- Third, the development in the direction of digital administration will most likely require investments in the technological infrastructure. But primarily, this development presupposes a pronounced

confidence in the success of transforming the public-sector organizations and their employees over into new ways of working.

In other words, the epoch of the large-scale public-sector IT-project is just beginning. For this reason, we have only seen the tip of the problems that the projects will be running the risk of bumping into if they are not handled and coordinated in a better way.

The report's experiences and recommendations must be regarded in this perspective. The desire to move in the direction of a coherent digital administration, in this way, only sharpens the demands about how future IT-projects in the public-sector ought to be organized.

The frames for national IT-projects

2.1 Synopsis

The problems in the five IT-projects being examined in the present report can only be attributed to a certain extent to the joint political, juridical and administrative outline-conditions to which they have been subjected. The consequences of these outline-conditions shouldn't be overestimated. There are, as a matter of fact, unexploited possibilities for changing the frames or for exploiting them in a better way.

This chapter reviews the most important outline-conditions that are common to all public-sector IT-projects. These outline-conditions have to do with the following five parameters:

- **Choice of solution-model:** The authorities in the public-sector generally have free hands when it comes to choosing IT-solutions. Traditionally, this has entailed that the authority in question has requested specially developed systems rather than consider the possibility of basing the solution on existing standard systems, when this can be done.

- **Rules surrounding appropriations and the political decision-making process:** In the present day, the appropriation system is so flexible that generally speaking, it does not pose an impediment (or a guarantee, for that matter) to the sensible implementation of public IT-projects. However, the system can play a part in fostering optimistic expectations about the project right from the outset – including fostering a sense of realism in the proposed budgets and time frames. This typically prioritizes the employment of external consultants in favor of people from the ranks of the public institution's own staff.

- **The cooperation between ministries:** The cooperative culture operating reciprocally between ministries is generally all too flaccid. There have been attempts to establish interdisciplinary initiatives, but there is really no incentive to share vital knowledge, including negative experiences.

- **Offerings-regulations and contract forms:** Denmark interprets the EU's offerings-regulations in a more restrictive way than do most other nations. This problem is only amplified by the fact that many offerers choose to use the standard contracts K18 and K33 drawn up by the Junior Council to the Treasury, which have to be regarded as being obsolete and highly inflexible.

- **Principle of public access:** The media and the public have a right to gain insight into the course of the large-scale public-sector IT-projects – and they do make use of this insight especially diligently whenever the projects transgress the budget or the scheduled deadlines. Fielding such pressure from the media, from politicians and from the public eye can seize hold of considerable resources and can make it all the more difficult to solve problems between buyer and purveyor. But it is obviously not the reason for the project's difficulties.

This chapter concludes with a number of recommendations about how these frames can be altered or utilized so that they will support large public IT-projects of the future, in the best possible manner.

2.2 Choice of solution-model

Each and every public institution is invested with the responsibility of choosing how it will be making use of IT in order to solve its tasks. There are no general rules covering the field here. For this reason, there are no stipulations issued from one central quarter concerning any particular solution model when a new system is to be developed. Neither are there instructive guidelines to help with the choice of technology or the like.

Within the sphere of government, to be sure, certain common, mandatory IT-systems have been developed. One of these is the Statens Centrale Løn-anvisning [National Central Salary Assignment]. There are also systems that have been developed for one entire sector or for one particular kind of task. For example, there are various tax systems and there are VUE, AMANDA and DEMARS. And, as something new in government, the Økonomistyrelse [Agency for Governmental Management] is offering an adapted version of a standard system, Navision, for use in other national institutions. However, what remains the most prevalent situation is that every individual authority finds its own solution. As a rule, it has up until now been the customary thing to develop a tailor-made system from the ground up.

In certain instances, what does prove to be most expedient is to develop entirely new systems. Standard systems – for example, those designed for the tax administration and for the CPR [personal identification number] - are typically not found on the market. Neither are they typically to be found in the governmental administrations of other nations. Nor is there a salary system to be found on the market which without considerable adjustments would be at all capable of solving the special tasks in the national or the municipal salary assignment.

Many authorities are also suffering from the misunderstanding that their needs are so special that, by definition, they simply cannot be fulfilled by the market's standard systems. It is the assessment of the work group, however, that the difficulty in

arranging the pattern of work to fit existing standard software will often be much less than the difficulties involved with facing the risks connected with developing new and untested systems. Even though the standard systems first have to be adapted to the pertinent authority's special needs, among these being that they have to combined with an existing system.

This understanding, then is little by little about to disperse itself throughout the public-sector:
- **All ordinary office products of the present day are standard systems – with Microsoft Office as the predominant system.**
- **Navision is now being introduced – with the necessary adjustments – as a general system for controlling the economy in the government, replacing the specially developed SCR system.**
- **The economy control module in VUE is based on Oracle Financials, with the extra development of modules for SCR and SCL. The project was originally based on a specially developed economy module.**

The tendency to exploit the standard systems whenever possible will reduce the developmental expenses and the technological risks attendant when new systems are specially developed. However, there are also limitations on how much a standard system can be adjusted, without certain risks cropping up in connection with the use of future versions and in connection with the system's capacity to perform. In this regard, it is also crucial to understand clearly that it can be equally demanding to control an IT-project when a standard system is going to be expanded and implemented. This is especially due to the fact that in this case, there will be the same or maybe even greater requirements posed on adapting the organization's existing pattern of work to the new system.

2.3 The appropriations and decision-making processes

National IT-projects are normally financed by the institution's ordinary frame-appropriations set aside for operational expenditures, even when we are speaking about projects that will be transpiring over several years. It is only the very huge projects that are specially presented before the Finance Committee. Of the five projects under investigation here, VUE, AMANDA and Navision were presented before the Finance Committee. Told o Skats Erhvervssystemet and EASY are financed by the institutions' operational funds. But there is no clear praxis in this area. For example, every year, Told-Skat and the Agency for Governmental Management invest considerable millions of crowns in system development projects without having to specially put these projects before the Finance Committee. In the (Danish) legislative years 98/99 and 99/00, accordingly, only 16 out of more than 600 cases put before the committee had anything at all to do with IT-projects. Of these, half of them involved AMANDA.

In principle, it is the individual minister who bears the responsibility for IT-projects within the sphere subsumed by his/her ministry. This holds true notwithstanding the fact that in praxis, the project frequently transpires in a de-centralized manner within the ministry and regardless of the fact that the minister, in reality, has only very limited possibilities for familiarizing himself with or following the course of any one particular project. Nonetheless, it will be the minister who will have to be accountable for the project before the Parliament, the Finance Committee and the National Auditor.

Regardless of whether an IT-project is specially presented before the Finance Committee, the pertinent authority will typically try to secure the necessary support for the project very early on in the elapse, so that this can form a part of the ministry's total prioritization and maybe even a part of the basic assumptions for some envisaged legislation. But at this point in time, both the project's economy and schedule will tend - as a rule - to be highly uncertain. In this phase, the authority will thus be inclined to emphasize the project's advantages, while its risks and expenditures can easily be underplayed. The problem with this is that "the die is cast". As soon as a total price and a time-schedule are presented for the first time, it is hard to come back again with a more thorough estimate of price and time frame, if such an estimate is less optimistic than the initial one. This will easily come to be construed as a sign that there is no steering of the project – and consequently it can carry the minister in the critical searchlight of the public eye, the Parliament and the Finance Committee.

This way of presenting the problem becomes very clear when an offering transaction shows that the incoming offerings are significantly higher than expected. This was indeed the case when the development of Det Centrale Virksomhedsregister [The Central Business Register] was offered. The Ministry of Taxation and the Danish Office of Statistics had been struggling for quite some time about who was going to be responsible for the development – and as part of this process, they were also competing about who could solve the task in the most inexpensive way. Consequently, the politicians were tainted from the outset with an all too optimistic picture of what the system would come to cost. The underestimate of the costs was, so to speak, built right into the decision-making process.

If certain preconditions such as budget or schedules for an IT-project change with respect to the information that the Finance Committee has been given, the project must be presented before the committee all over again. Normally, this does not entail that the pertinent authority, as a whole, will be granted additional funds. The ministry in question will typically have to make cutbacks elsewhere in its own organization. It is only in very rare cases that the Ministry of Finance will accept that the total amount of funding granted to a ministry will

be larger due to circumstances that an IT-project has become more expensive.

The purpose of the appropriations regulations is to secure the Parliament's insight and control over the government and the administration. On the other hand, they are not suitable as bases for the actual control of IT-projects. In point of fact, it has never been the idea that the Finance Committee should operate as a kind of board of directors for the individual ministry's business. In recent years, the Finance Committee has in a number of instances put forth a demand with respect to regular reporting on large-scale IT-projects, such as VUE and AMANDA. Such reporting does not alter the circumstances that it is still the minister in question who has to assume responsibility. On the other hand, the reporting process naturally signifies that, in certain periods, there is a special political focus on a project.

In November 2000, as a link in setting the annual budget, the government already took the initiative to adjust the appropriations rules. Among other things, the idea here has been that rules have to be set firmly for the risk-assessment of a project before it is presented to the Finance Committee.

Taken as a whole, the appropriations system is so flexible today that it can hardly be said to impede or to ensure a sensible implementation of the IT-project. Nonetheless, there is a tendency built into the system that prioritizes the use of consultant support to the detriment of using the authority's own resources. This is because the amount of salary money allotted to the authority's steadily employed staff members is considerably less flexible – and much more difficult to gain political endorsement for raising – than are the operational funds which can be drawn from for the purpose of purchasing external consultant support. And on top of this, it can also be difficult or time demanding to fit the project leader or other key personnel working in the IT-projects into the existing employment- and salary-structure.

2.4 The cooperation between ministries
Within the sphere of national administration, there has been no development of a tradition for the various ministries drawing on each other's experiences. Nor is this so in the IT-area. To be sure, over the years, there have been different forums for the exchange of experiences in the IT-field, most recently the National IT-Council and the IT-Forum. But the really valuable experiential exchanges about problems with IT-projects occurs unsystematically and thus makes no contribution worth being mentioned to the construction of competence extending across the various ministries.

The lack of a systematic gathering of and access to others' experiences obviously constitutes a barrier for the public-sector IT-projects. Especially when we take into account that no authority in itself can construct the sufficient experiential foundation. On top of this, the development of larger IT-systems transpires only rarely, and the experiences are thus bound to be fully or partially obsolete.

Nor is there any tradition for making full or partial use of "recycled" IT-systems, which have been developed in other parts of the central administration. Such systems might be quite capable of dealing with case consultancy or processing of documents. In certain instances, this can be related to not having taken questions of licensing or copyright into account in the contractual situation. But more generally, it constitutes an expression of the fact that the individual administrative entity perceives its own task as something so extraordinary that it calls for a unique solution. The ministries, in this way, fail to make good use of the "large-scale operations advantages" that can be generated by appearing as one unified 'buyer' and establishing "conglomerate" IT-functions.

In many of the ministries, there has also been a lack of internal coordination when it comes to IT-development. Experiences with the employment of consultants and purveyors are not typically collected and communicated any further. It is also here that the ministries would stand to benefit by appearing as one large buyer and to evaluate the cooperation with the individual purveyors and consultants. See chapter 4. However, there presently seems to be a distinct and positive tendency toward establishing joint IT-functions. What can be achieved by this means are large-scale operational advantages and what can be secured is a "critical mass" of IT-knowledge in the organization. But this is far from constituting any guarantee for a better control of the large-scale IT-projects, where the management-related and organizational aspects are often more important than the purely technical aspects. See also chapter 3.

2.5 Offerings-regulations and contract forms
Today, the EU's offerings regulations have been incorporated into the daily activities of the various authorities. Over the last few years, they have been supplemented with an extensive and rather restrictive praxis, which has been firmly set through determinations handed down from the Complaint Board for Offerings. It is the assessment of this work group that in Danish jurisprudence, the offerings regulations are interpreted more restrictively than in either the other EU-countries or the central Commission. The reason for this extremely cautious course is presumably because no Danish authority wants to be a party in a new Great Belt case ("the buy-Danish-clause").

However, such praxis fosters rather unfortunate consequences for projects like large-scale IT-development. What we have are two demands that, in particular, run counter to the projects' nature and provide the occasion for considerable difficulties, in praxis: the demand for an exhaustive demand specification in the offering material and the prohibition against negotiating with those who are offering the estimate. There is hardly any private enterprise that would set such large-scale and complicated IT-development

projects into motion on a foundation of such regulations. In the first place, these regulations provide an obstacle to a constructive dialogue between customer and purveyor about the optimal solution within the budget and the time frame. In the second place, they freeze from the outset a dynamic developmental process solidly around a number of technical solutions which are impossible to specify at the starting point, and difficult or almost impossible to divert from once the development efforts have been put into motion.

It sets these problems in perspective when we consider that the EU's offerings regulations have now been in force for 10 years – as far as we know, without one single EU-offering of system development tasks being won by an enterprise from another EU-country which did not already have a branch office or a steady base in Denmark.

Even though the offerings directives set down a number of limitations, there is a need to look closely at how the regulations can be put to better use in Denmark in the present day. What experience shows, namely, is that it is possible to use the regulations more flexibly. Within the sphere of the regulations, there is, as a matter fact, access to setting up project competitions. There is also an opportunity for so-called "prior messages", which open up a foregoing dialogue about the projects' design. With such a dialogue, the potential purveyors can have a chance to prepare themselves in a better way for the project and to qualify their offer. Nor do the offerings regulations hinder a division of the project into phases, which would yield the possibility of bringing the cooperation to a close after an initial phase in the event that the project proves to be taking shape in an unsatisfactory manner.

What are perceived as restrictions in the offerings regulations are, in many cases, manifestations of the public authorities' choice - in the concrete offering negotiations – of a very stringent offering form.

Contracts for large-scale IT-projects are ordinarily drawn up on the basis of one of the two standard contracts, K 18 and K 33. These two forms were prepared by the Junior Council to the Treasury around 1990, in order to aid the national authorities with contractual matters taking place in connection with IT-purchases. Most of the national agencies presently use these contract forms. And this is supposedly because in doing so, lots of criticism of the formal circumstances surrounding the projects can be avoided. See chapter 4. But both the customers and purveyors are often heard to say that these contracts are exceedingly stringent and are, in fact, obsolete. Certain consulting firms are suggesting to their customers the use of contract forms that are considerably more flexible.

Ordinarily, in the national contracts, there is no positive incentive built into the agreement for the purveyor to supply the optimal service to the customer. Such an incentive could take the form of a bonus which would be redeemed, if a partial delivery is made as agreed. There seems to be a need for developing contract forms that contain both the whip and the carrot: sanctions, if the contract is breached and rewards for fulfilling the contract beyond expectations.

The purveyors tend to be especially critical of the existing standard contracts on the following points:

First, these contracts entail that the offerer of the project, in practice, can denounce any responsibility for the implementation of the project. On the private market, as a counterexample, the normal procedure is that the purveyor limits his/her liability for damages to a certain percentage of the contractual sum. But with forms K18 and K33, the purveyor's liability in public projects can in principle amount to a sum that lies over and beyond the contractual sum and is limited solely by the Danish rules of indemnification.

Second, the normal situation in these contracts is to presuppose it as a given that the purveyor will assume responsibility for third party software. In a number of instances, such a requirement is just not realistic, especially when the purveyor has no access to the source code, as is the case with Microsoft's products.

Third, what arises with the existing standard contracts is often a quarrel about whether it is the offerer's demand or the purveyor's system description that is to be supplied. Today, for example, addendum 2 in K18 ("customer's requirements") takes precedence over addendum 4 (the purveyor's system description). In several cases, the result of this has been that the two parties do not have the same perception of what is to be supplied. The offerer has chosen a bid, but maintains that, juridically speaking, the purveyor has to live up to the customer's demands. This means that, from the outset, the juridical aspects of the developmental elapse run the risk of becoming the predominant element. See also chapter 4.

The government has now taken the initiative to review the existing standard contracts and to assess whether new and more flexible models for offering material and contracts for system development assignments will be have to be prepared. These efforts are being carried out under the auspices of a subcommittee of the Research Ministry, with the participation of juridical experts and branch organizations. It is the opinion of the work group that these efforts are important; we find it to be crucial that there be considerable improvements in the existing contract forms.

2.6 Principle of public access
In matters concerning IT-system development, the regulations governing public access in the administration are in force. What this means is that, as a

point of departure, there is access to the ordinary right of access to documents that pertain to the case. The right of access to documents can be restricted, however, when it is necessary to protect important considerations concerning the economic interests of the public – for example, in connection with contractual negotiations – or when it is of vital economic importance to the enterprise, when we are speaking about information, that access to documents should not be granted.

Naturally, the public's and the media's interest tend to gather around those situations where there are problems or conflicts in the relationship between customer and purveyor, or where the public authority displays signs of internal discord about how the system is to be developed or utilized. For enterprises that are not accustomed to supplying to the public-sector, both the rules of this game and the media focus can engender a certain sense of alarm in the relationship with the customer, especially when problems surrounding a delivery happen to turn up.

But there is no reason to believe that the rules about public access and access to documents in themselves engender problems in connection with the control of public IT-projects. But this presupposes that the management of the public-sector buyer must be prepared to provide explanations when confronted with public scrutiny if problems should turn up in a particular project. This can call for considerable resources and thereby weaken the very same managerial power that might be better used for solving the problems. This is, however, the condition that is increasingly coming to be a common feature of all aspects of both political and business life. And as we all know, the response must be made with a thorough, ongoing and open channel of information made available to the media and the public eye – preferably before the moment when the projects are declaimed as "scandals".

2.7 Recommendations

By definition, outline-conditions are circumstances that can only with great difficulty be altered in the short term. However, in most of the areas that have been reviewed in this chapter, it is possible to adapt or utilize the frames in a way that can actually strengthen the implementation of large-scale IT-projects. According to the work group's assessment, the most important improvements will be:

1. **Dampen the ambitions about specially developed IT-systems.** It ought to be a general praxis with all public-sector IT-projects to evaluate whether the organization's goals with the IT-system cannot more advantageously be attained with standard components with reasonable extensions or by "recycling" elements from other public authorities' systems.

2. **The modernization of standard contracts K18 and K33**, which has already been put into motion, ought to be assigned a rather high priority. These efforts ought to yield new and more flexible models for offerings and for contracting system-development assignments. As a natural part of these efforts, what latitude Denmark has for interpreting the EU's offerings regulations in a more beneficial way than heretofore ought to be carefully examined.

3. **Wherever possible, the government ought to appear as one single large buyer.** In the first place, this will provide the possibility of exploiting large-scale operational advantages and on establishing "conglomerate" IT-functions that straddle the central administration. In the second place, it will provide the possibility of a more systematic way of building up and exchanging experiences with public-sector IT-projects. The government ought to elaborate guidelines for how this can take shape.

4. **The political understanding of the dynamics of the IT-development projects must be strengthened.** The political management will have to ensure the support for the overall goals and frames for the projects. There will have to be a clear acknowledgement that it is simply impossible to set firmly all of the needs from the outset of the project and that changes will inevitably be arising along the way in the course of the project's development. For this reason, the economic frames will also have to be adapted in the light of the projects' risks. The need for political understanding and support will become even greater, in synch with the fact that the projects are becoming more complex and are beginning to cross over the boundaries between different sectors of the public administration.

The public-sector organization

3.1. Synopsis

A very significant portion of the problems in the public-sector IT-projects being examined here can be attributed to internal relations within the organization of the public-sector buyer. What is involved here, especially, are the organization's understanding, prioritizing and supervision of the projects. *In the final analysis*, all of these factors fall back on the management. But specific problems can be found on all levels in the public-sector buyer's organization: from the uppermost political and administrative management on down through the project organization and the project management to the leaders and employees working in the rest of the organization.

Although there are significant differences among the five case study projects, there is a common pattern that delineates itself.

In the first place, the IT-project has either not been anchored firmly enough in the organization's top management or the management has misgauged the character and significance of the project. The result has been that IT-projects with very great implications for the development of the entire organization have not been infused from the outset with the managerial resources and the attention that were required.

In the second place, precise goals for the IT-project have not been formulated - goals that could be seen in connection with the organization's strategy and objectives. On this account, the project has been missing a very important management tool. Furthermore, it has been impossible to evaluate the extent to which the project has strengthened the organization's "business-related goals", including improved service to the users, more effective case consultancy and/or lower costs.

In the third place, the management has failed to ripen the organization, this means to say they have failed to ready the organization for developing and using the new IT-system. The management has not been clear beforehand about what it will require to implement the project and has not been clear about whether the organization is at all capable of getting the job off the ground. Fostering the correct understanding of the project on all levels in the organization and developing the necessary areas of competence have simply been neglected.

In the fourth place, the supervision of the entire course of the project has been all too lax. Among other things: the project has not been sufficiently staffed, the risk-control has been missing, the users

have been called into the process in the wrong way and no attempts have been made to split the project up into shorter phases with sequential deliveries of partial systems.

These four problem fields are clarified further in the present chapter, which is rounded off with a number of recommendations.

In a number of situations, it can be ascertained that the aforementioned problems have not been brought to light along the way by the involved consultants and purveyors, whom we might otherwise have reason to suspect would have had similar experiences in previous projects. The problems with purveyors' and consultants' efforts and with the interaction between the various parties will be treated separately in chapter 4.

3.2 The responsibility of top management

Experience gleaned from the investigated projects shows that only seldom does the management possess sufficient resolve from the first day to assume responsibility for the development of the new IT-system. This applies to the work with designing and implementing the project as well as to the initial use of the finished system. And as a result, the project has been running on a short supply of the managerial power which constitutes one of the prerequisites for success. In many instances, this has enshrouded the project's expiration in doubt. Just who it is that is actually entrusted with the responsibility of ensuring the project's forward motion remains all too vague.

A large-scale IT-development project will always have significant consequences for an organization's structure, for its everyday operations and for its developmental possibilities. This is why it is a very serious problem that what seems to be so sorely missing in the case study projects is a strong and persevering commitment from the uppermost levels in the organization. The purely technological problems in the projects have in many cases been far less insurmountable than the managerial problems: the glaring deficiency of management - and managerial responsibility - has in many cases constituted a central risk factor throughout the course of the projects.

Moreover, the political and administrative management has in certain cases been too feeble when it came to plotting out and securing the overall requirements and frames for the project. In a number of instances, what has been missing is a body of management that was capable of cutting through and weeding out proposals that were not beneficial to the system as a whole. The consequence of this has been that these projects just swelled up - and the systems ended up being far more complicated than

necessary. In the VUE-project, the institutions were operating under the assumption that the system would not be inferior - on any single feature - to the best operating system that could be found anywhere else in the country. As one among many periphery wishes, one of the universities happened to put forth a request that the system ought to be able to handle information about the students that die. But this is a parameter that involves approximately 10 people every year.

Mainly, the top management has failed to ensure that the IT-project had a clear objective that would underpin the organization's strategy. (See also the next section about goals and strategy.) In other cases, the management neglected to make the project's objectives known and accepted in all parts of the organization. Among other things, this has led to the situation that, on other levels of management and among the coming users, demands and wishes were imposed on the system that were built upon widely disparate notions about what the system was to be used for and about what procedures the system was supposed to support.

In the ongoing development of the project, it is the organization's uppermost daily management who have generally neglected to position sufficient managerial muscle behind the project. And furthermore, the attitude on the managerial level throughout the rest of the organization has, in a number of instances, largely been: "He who lives well lives quietly". That he who refrains from taking any responsibility cannot be called into account. There has been a marked attempt to avoid coming into contact with any of the problems that have arisen along the way. In several instances, this has entailed that the project - and the project management - came to be isolated within the organization. Among other things, this also meant that there was no sufficient backing from the rest of the management for re-aligning the organization and for adjusting to new procedures before the system was to be put into operation.

Securing an effective organization of the entire course of the project ought to be one of management's main tasks. Among other things, what is involved here is that there be a clear procedure, where responsibility and the competence to make decisions are firmly lodged on the proper levels in the project organization and where for this very reason, the distinct role of top management is also visible. The case study projects, unfortunately enough, are rife with examples of how responsibility and roles have not been clearly apportioned. For example, in many instances, the role of the steering committee has been vague and the participants in the group have not been properly informed about their own duties. The steering group and the project leaders have both suffered from the project organization's lack of authority to make decisions and assign priorities.

3.3 The lack of goals and strategic focus

When it comes to IT-projects, the focus is often made too narrowly on technology. One of the consequences of this is that the systems are not developed for what they are actually going to be used for. For example, in the Amanda-project it was insistently expressed that there had to be short response times – that is to say, the system had to be quick. In tandem with the requirement that the system was also becoming more and more complex, the quantity of information that could be brought forth on the screen - with each individual screen image - now had to be minimized in order to keep the response times to a minimum. The upshot of all this was that a basic registration of one unemployed client now takes an inexpediently long time, because the case worker now has to take the time needed to call up many different images onto the screen.

What the foregoing example suggests is that when a project is first put into motion, there is a tendency for all kinds of discussions about technological possibilities and practical problems to steal attention from the "business-related" objectives and the results that the organization aspires to attain. The IT-system becomes an end in itself – instead of a tool for developing the organization in the desired direction. In the incipient phase, there has been a lot of talk about the advantages of - and the savings offered by - the new systems. But when the course of development has first been put into action, it has quickly come to be a matter of getting the large-scale project in tow. The advantages that served as the very starting point for investing in the project have now slipped out of view. There is thus a need for far more strenuous efforts in maintaining the focus on these goals.

In the case study projects, it is only to a very meager extent that objectives have been drawn up for the system, objectives that were devised in ensemble with the organization's overall visions, strategies and plans. And what has been missing are clear and measurable demands about what the organization was going to gain from the project in question. And this has made it difficult to assess, along the way, whether the project was fundamentally on the right track.

For example, neither in VUE nor in Amanda were quantitative success criteria drawn up from the outset for what the systems would result in accomplishing - in terms of savings, streamlining or efficiency engineering. In both of these cases, the success criteria were couched in very general figures of speech, which were difficult to render measurable and to follow up. They have also been utilized to only a very limited extent for keeping the projects on the right track or as tools in connection with the changes and re-prioritizations that cropped up along the way.

New demands on the systems, then, were not met with corresponding demands on de-prioritizing or removing certain less essential elements. In

this way, the aggregate systems always have a tendency to balloon up. In other projects under investigation here, there has also been a lack of calculation about what the organization would be deriving from an
IT-project – for example, in computing the economization of labor power (computed over the course of a year) or system resources. In several cases, this is partially due to the fact that neither the buyer nor the consultants nor the purveyors had any total overview about what the large-scale systems were to become or about what consequences these systems would have for the organizations.

Clear objectives also constitute a prerequisite for management's capacity to inspire appreciation and gain acceptance for a project throughout the whole organization – also if it happens to involve savings or restructuring. An early announcement of the objectives affords a longer period of time and better conditions for making the organization ripe for changes – including carrying out the necessary adjustments of the personnel.

Among the institutions of higher learning in the VUE-project, there was a pronounced mistrust about the system's expressed purpose: creating a better administrative system for the institutions of higher learning. The general perception was that the sole aim of the system was to tighten the ministry's control over how the institutions were administering their time and resources. The fact that the system was perceived exclusively as a control system seriously curbed the project's forward motion. University politics stepped into the project from the first day, and the system failed to obtain the necessary backing. The objectives of the system were never really accepted and very quickly, they glided away into the background. As one of those involved expressed it: "The system was born in sin".

By the time summer of 1995 rolled around, the VUE project was going through a serious crisis and a series of consultancy investigations was put into effect. When the project was resuscitated, the Ministry of Education consequently felt compelled to allow the separate institutions to choose– under certain prescribed conditions – whether or not they wanted to put the new system into use at the time the development was finished. Most of the institutions were positively disposed toward putting VUE's economic system into use, but the University of Copenhagen and the Copenhagen Business School chose not to utilize VUE's studies-administration system. Altering their own curricula and their own studies administrations to fit neatly into the new system was simply not desirable. Instead, these institutions chose to develop their own tailor-made systems – and to accept having to pay the price for doing so.

3.4 Lack of organizational maturity
If a larger public-sector IT-project is going to stand any chance of being implemented with success, then it has to be understood and arranged from the outset as an *organizational development project which is to be propped up by IT*. This has not – to a sufficient degree - been the case. Accordingly, the public-sector buyer has typically been focused all too narrowly on the project's *technological* consequences and stipulations and has underestimated the *organizational* consequences.

There is no doubt that the organizations' lack of maturity has played an important role in the expiration of all five case study projects. For this reason, we suggest that there is a need for the public-sector buyer to critically evaluate the project's organizational capacity before the project is put into motion. This could either lead to a more precise plan for how the organization can be ripened for purposes of coping with the project or to an acknowledgement that this particular project is simply not feasible and that the project can accordingly not be implemented until such maturity exists.

On the background of experiences from the case study projects, it is the work group's assessment that, generally speaking, the maturation ought to be strengthened in four areas:

In the first place, what must be established, as has been mentioned in section 3.2, is a stronger *managerial commitment* to the IT-project on all levels in the organization – that is to say, also on the part of the mid-level managers and the leaders of any decentralized entities. What needs to be created especially are an understanding and an acceptance of the interaction between the organization's steady management structure and the project organization's management. In one project, for example, what came to light was that one particular department in the organization, which was going to be the end-user of a very important part of the system, actually failed to respond to the project management's inquiries at the time that the demand specification was being drawn up. The management chose to just go right on ahead, harboring the attitude that if certain people didn't have anything to say, then they would just have to be satisfied with the demand specification, as it was. This is merely one extreme manifestation of the general situation that the organizations' managerial layer failed to take the project seriously enough.

If the system is not secured from the outset with backing from all levels of management, then the rest of the organization will also fail to feel any sense of ownership for the system when it is being implemented. There are several examples of how on paper, the different managerial levels seemed to be involved in the project while, in point of fact, there was a glaring lack of any real commitment. In the Amanda-project, for example, there can be no doubt that the wish expressed by the unemployment agency's regional offices for a more autonomous liberty of action made it all the more difficult for the management and labor authority to carry out the

development project within a central framework. This kind of problem is equally pronounced in the VUE-project.

In the second place, what have to be constructed are the requisite *areas of competence* for realizing the development project. Among other things, this means to say that the organization has to ensure that it has at its disposal sufficient internal competences for key functions, such as project management and the quality assurance of the IT-project, among other things. Or that these areas of competence can be acquired through the means of training or recruiting new employees. All too frequently, the organization underestimates the number of employees that are required for the successful implementation of the total development project and the focus is aimed too narrowly on the need for technological competence. The result of this is that later on in the course of events, an inordinate quantity of resources has to be utilized for getting the system incorporated into the everyday life of the organization.

It is clear to see that working in a project-oriented and development-oriented way has sometimes occasioned problems for the public-sector organizations. As case-working agencies, they have found their niche in a rather traditional, hierarchical form of organization which does not always jibe especially well with the organization of an IT-development project, where there is especially a need for direct managerial access and a need for non-bureaucratic decision-making processes. In practice, what this has entailed is that the project organization has possessed all too little decision-making competence. And this has deprived the projects of the necessary dynamics and drive. What has also been lacking is an understanding – on the part of the management and the employees in the organization and among those who are directly involved in the project - of methods of work, apportionment of responsibility and communicative channels.

In a number of the case study projects, vague configurations of responsibility and indistinct avenues of communication between the host's organization and the project organization served to undermine the entirely crucial confidence between the two. As a matter of fact, perfectly reasonable guidelines for communication and responsibility are often drawn up, but then they are not followed. In several instances, the result of this has been that all communication surrounding the project's development has transpired in a closed circuit, spinning between the project entity and the organization's top management.

In the third place, there will have to be efforts that are far more goal-oriented in creating a *common awareness* in the organization about the purposes, the course and the consequences of the project. An IT-project presupposes a significant alteration and a

harmonization of procedures and pattern of work. And without an extensive understanding of these factors on the part of the employees, the project will inevitably come to engender uncertainty or downright animosity in the organization.

Generally speaking, creating the necessary understanding within the organization that it is precisely one of the main ends of the new system to alter the patterns of work and to render them more efficient has not proven to be an easy task. "It must be the technology that should be adapted to people, and not the other way around", is typically heard as a ¡critique whenever a new system poses challenges to established habits and routines. But of course the assertion only makes sense if the organization is already solving its tasks in the most efficient way – that is to say, with the new technology's possibilities. Otherwise, it is a very expensive excuse for not making use of the possibilities offered by the new technology.

The maturation of the organization consists here, among other things, in making it clear that the employees will also have to be making changes if the developmental project is going to attain its goals. It is often especially necessary to bring about this understanding on the part of any de-centralized entities and users who – our experience shows - frequently call for very extensive adjustments in the systems. But it is important to make it clear that joint IT-systems need not pose a hindrance to being able to organize the work locally and in a flexible way, even though there may naturally have to be a compensating adaptation in the common basic system.

In the fourth place, it is clear that IT-projects that are developed for several different institutions at once (like Navision Stat) or for one central authority with decentralized entities (such as Amanda, EASY and VUE) face a considerably greater risk of running into problems.

The extra risk is not only due to the fact that such projects are necessarily larger in scope or that they are essentially different from IT-projects implemented within the scope of a single organizational entity. Another factor to consider is that these projects typically involve more decision-makers, more organizational cultures and also – consequently - potentially more opponents. It is especially from the management of the decentralized entities that the resistance to "standardization" is typically strong. Among the most ordinary critical points voiced in opposition to the central, system-developing authority is that it is lacking in insight in - and respect for - the needs of the decentralized entities and that it therefore underestimates the extent of the organizational changes that the system will be demanding locally. However, the many local and specialized additions and changes in the system only serve to make it unnecessarily complicated and it then becomes all the more difficult to move the employees around inside the organization.

It is plain to see that the animosity directed toward central insight into - and control over - the organization's work often plays a crucial role. And the criticism that is directed toward the central level shows – whether justified or not – that the maturation process has not reached its sufficient bloom in the organization.

3.5 Problems with controlling the projects

Above and beyond posing the aforementioned problems related to management, goals and strategy and setting forth the problem of maturity, there is good reason to point out a number of more concrete problems which can be summarized in terms of poor control of the elapse of an IT-project. These are impacted in the following areas where:

- The project is not appropriately staffed
- The experiences of others are not called into play, personal experiences are lost
- Risk-assessment is missing
- The project has not been split up into partial deliveries
- The users have been called into the process under erroneous premises
- The problems when the system is put into operation

Each of these areas is described in detail on the following pages.

3.5.1 The project is not appropriately staffed

There are a number of examples indicating that the project organization has not been sufficiently and appropriately staffed – either quantitatively or qualitatively. The most proficient staff members have not been released from their normal duties for purposes of solving the job in question. In several instances, the project's participants have only been partially set free from the responsibilities of their normal jobs. This is unfortunate for the fate of the project, also because it sends out a signal to the entire organization that the project does not have a particularly high priority.

The problem is especially critical when the importance of an experienced and competent project management is underestimated. The project leader's qualifications and professional insight is – along with the necessary backing from the top management – one of the key elements in a successful IT-development project. Ineffective and inexperienced project management is another major cause of the failure of IT-projects. This is especially so because disciplines such as project planning, risk-control, the proper handling of modifications, the elaboration of basic agreements and the like are not mastered with a sufficient degree of proficiency.

In the case study projects, there has been a marked tendency to underestimate how much the project management's- experiences mean with respect to the organization's capability of implementing a large-scale IT-project. The result has generally been

that the people who have been engaged in the process are employees in the organization who certainly do have experience with running an IT system but who typically do not have any experience with the expiration of a large-scale project and do not possess the necessary eye for the organization's patterns of work and developmental needs.

The absence of experienced and competent project leaders in the incipient phase of the project entails that no professional project control is established at the outset. For this reason, it becomes difficult to supervise and to match the purveyor when there are questions about enterprise management, processes of authorization and quality control of the deliveries. This deficiency in the administration of the project management's responsibility has in several situations become quite a problem for both buyer and purveyor. Because when the project management is not strong enough to cut through, sort out and assign priority to the modification proposals, all too many unanswered questions begin popping up, in the form of disagreements between the buyer and the purveyor.

One of the reasons for the weak project management is that the public-sector generally has a difficult time recruiting, training, and keeping qualified project leaders and staff employees with experience in project work. Since most public-sector institutions only carry large-scale IT-projects into effect with several years of interval in between each project, it is difficult to hold on to the necessary expertise. On top of all this, project management does not exactly occur naturally along the pathway of careers running through employment in the public-sector. As a way of counterbalancing this situation, the decision in many instances has been to pay private consultants for project management competence. The problems that this entails are described in further detail in chapter 4 of this report.

3.5.2 The experiences of others are not called into play

If public-sector institutions are going to improve their chances of realizing successful IT-projects in the future, these chances will depend on the effectuation of systematic evaluations, which can gather up the threads of both positive and negative experiences with the implemented IT-projects –including, especially, experiences with the involved purveyors and consultants.

In light of the many problem-filled IT-elapses in the public-sector, it is indeed striking that not until the present time has such a *systematic* collection of experiences and a dissemination of know-how been initiated, and this work is being carried through the agency of the National IT-Council. See also chapter 2. What is even more disturbing is that no thorough attempt to procure experiences gleaned from similar projects appears to have been made in *any* of the IT-projects being examined in this report. These five IT-projects, then, have been implemented without any

basis of qualified expertise about what might have gone astray in previous projects. To put it coarsely, each of projects has started out from square one all over again.

It goes without saying that not all experiences can be transposed from one project to another. This is partly because the public-sector organizations - and their IT-projects - are very different from one another and partly because the technological premises are changing very rapidly. Nevertheless, many of the processes of which the projects consist will prove to be identical. This would apply to experiences with areas such as the ripening of the organization, management, user involvement, risk-assessment and rules concerning offerings.

Deficiencies in the exploitation of experiences spanning the national sector – especially - underscore the urgency for strengthening the co-ordination between the ministries whose work is connected with this sphere of development. The government has certain obvious possibilities for taking action as one enormous, unified and very strong purchaser in relation to the individual purveyor, who might happen to fail to live up to his/her obligations. But this presupposes that in these matters, the central administration will be capable, to a greater extent, of appearing as one single organization that can successfully coordinate its experiences and its demand, rather than appearing as 20 "mutually competitive" ministries.

3.5.3 Risk-control is missing

Large-scale IT-development projects always contain considerable risks. The technological and organizational interaction which has to be established is so complex that unforeseen problems and deviations from the plans cropping up along the way are unavoidable. All the more important, then, is it to carry out a systematic risk-control of the project. Among everything else, it has to *identity* possible risks, *evaluate* the probability and the consequences of each individual risk and set up plans for how each and every one of the risks can be *eliminated* or *handled*. Risk-control is also a good way of pressing critical information upward in the organization with the concomitant result that the uppermost management is compelled to address itself to the findings.

There are great differences in how risk-control has been employed in the case study projects. In several instances, however, the risk-control has either been missing entirely or has been handled erroneously. The most ordinary mistakes and omissions have been:

- **There is a tendency to focus all too narrowly. For example, potential conflicts between central authorities and decentralized users have not been taken into account.**

- **The focus is centered only around factors that the management can control. For example, neither altered legislation nor changes in technology are included in the risk-assessment.**

- **There is no realistic assessment of the consumption of time and the consumption of resources. Among other things, because there has been a tendency to estimate the time required for case consultancy.**

- **There is no systematic employment of the results of the risk-control. And warnings about new risks that might turn up along the way in the course of the project are not taken seriously, with the consequence that there is no attempt to eliminate the registered risks.**

- **The consequences of key staff members leaving the project prematurely are not taken into account.**

Moreover, the work group is cognizant of only one instance where an organization made any attempt, during the phase of improvement, to carry out a risk-assessment. But this was allegedly abandoned because risk-control was perceived as being "the devil's tool": its sheer existence would only tend to give sustenance to problems that would otherwise fail to turn up! This was the argument for the decision, a decision that later on came to offer a wealth of opportunities to regret.

3.5.4 The project has not been split up into partial deliveries

It is the perception of the work group that large-scale IT-projects which are resolved, developed and implemented "in one fell swoop", are relics of the past. All experience – including the experience gleaned from the projects we have investigated here – speaks in favor of the total project being split up into smaller partial projects. Every one of the 'partial' projects ought to run over a time-period of – as a maximum - six months and, as a rule of thumb, ought not to involve more than thirty IT-people and an equal number of users. The partial projects must be autonomous, demarcated and serviceable parts of the total solution, which can be implemented step by step. Typically, it is difficult to divide projects up that have been arranged on the basis of a series of demands on the new IT-system's *functionality*. An important precondition for a sensible way parceling out the total project into partial deliveries would therefore be to organize the development project according to what *business processes and patterns* of work the system has to support. Of course, this will also be reflected in the demand specification and the project plans. However, this now calls for another way of working and the division of the projects can, of course, give rise to other kinds of risks.

There is, however, a long line of circumstances that speak well for such a division of the project:

- It facilitates an ongoing process of development where there is a tendency to become wiser all the time.

- It becomes easier to specify precise demands with respect to each of the parts – and to keep updated all the while about how these demands are being fulfilled.

- A change of mind and a change of plan along the way become possible if the technological stipulations for the project change in any significant way.

- The consumption of both time and resources becomes easier to manage.

- Operationalization can transpire gradually, and the users will better be able to accustom themselves to the system.

- Better possibilities for revisions made along the way emerge when the demands imposed on the system change during the course of the developmental period, for example, as the result of new legislation.

- It offers better possibilities for terminating a project completely along the way, in the event that certain elements of the project have **not** been delivered or **cannot** be used.

Any one of these factors will increase the chance that the project's overall objectives can be attained. In several of the investigated projects, the choice has been made not to divide the whole into partial deliveries because this allegedly would have made the total project more expensive. In reality, such a division would probably have been much less costly.

In at least one of the projects, the idea of splitting the system up into several parts was put under consideration, but the buyer was advised against such a solution. The work group finds it disturbing that the purveyors and consultants working for the public-sector buyer have not supported the buyer's idea that such large-scale projects could and should be split into parts.

3.5.5 The users have been called into the process under erroneous premises

It is a matter of course that the aid of users is enlisted in the process of large-scale public-sector IT-projects, partly because many users possess a profound degree of expert know-how, which is crucial to the development of the system, and partly because acceptance by the end-users and their representatives in the project is entirely crucial to whether the completed system will come to be successful in practice.

But in some of the case study projects, the way in which the users have been enlisted in the process has gotten sidetracked. Typically, one or more of the following conditions have given rise to problems:

First of all, several of the projects – in the endeavor to effect a thorough involvement of the users – have involved so many users and user groups that systemizing and coordinating their needs has grown into an immense and unmanageable task. It is a myth that involving *many* users is tantamount to a successful IT-project. Especially because at the same time, it is not always the most proficient members of the staff that are called in to participate in the user groups.

Second, among the users, it is often the specialists who predominate. Every individual area is thus well covered , but there are too few people involved who can think in terms of whole processes. Everybody is posing demands, but hardly anyone can foresee the consequences for the entire system. Moreover, requesting changes within their own specialized areas is often "free of charge" for the specialized users, because they do not have any direct responsibility for the IT-project's economy or for the system's overall functionality.

Third, only seldom do the participants in the user group have any profound insight into how realistic their demands are – when it comes to technological and economic parameters or in relation to the system's overall objectives. They voice their demands and their wishes on the basis of their – often very different – notions about what the system is to be used for.

Fourth, it can be difficult for the users to fashion for themselves a conception of how the final system is going to appear, in a concrete sense. Until the users have a chance to test out the product in practice, the system remains abstract. While they are sketching out their requests, then, the users therefore run the risk of overlooking possibilities and limitations in the new system. This problem could be diminished considerably if the system were divided up into modules, which were sequentially implemented. See also section

The main problem in "user involvement", however, is an all too frail control of how a large quantity of widely different user demands can be converted into operational decisions. It is imperative that the users' demands be challenged by the project management so that they can be critically evaluated in relation to both the technical design and the success criteria for the total project. Otherwise the project explodes in the hands of the participants.

On account of management that is too ineffectual, there are all too many wishes and demands that have been written into the demand specification and/or carried into effect as modification requests in the course of the project's development. In a number of cases, this has resulted directly in a reduction of the system's functionality and it has both delayed the development process and made it more expensive. As a crude example of this, one user group was

carrying on a discussion with the purveyor for half a year about whether a "menu bar" in the system should be blue or gray. What was indicated on the demand specification was 'blue'. However, for technical reasons, it could only be gray. It was not until half a year had elapsed that the project management intervened, and the user group accepted the gray-colored menu bar.

3.5.6 Unexpected problems when the system is put into operation

When a new IT-system is going to be put into operation, what really becomes plain to see is whether the organization is ready for it.

It is especially out of consideration for the employees that advance notice of the deployment of the system must be given and must be prepared for with a sufficient amount of time. This is especially true because the system's deployment is generally accompanied by organizational alterations and layoffs or resignations. Here, a longer time frame affords better possibilities for getting started with the necessary training and for making the necessary adjustments in the manning of the staff somewhat less painful. It also speaks in favor of putting the system into operation by degrees.

It has been a recurrent feature in a number of the projects that there were unrealistic expectations about how the initiation of the new system would transpire. In one of the projects, it was the notion at the outset that the new system's users could simply be given the program on floppy discs, and then they would somehow manage to figure out the rest for themselves: how to make adjustments in the organization, how to purchase the proper hardware and how to train other users.

In the case study projects, one or more of the following problems have turned up at the moment the IT-systems are to be put into operation:

- In several cases, the training of the users has been confounded with making adjustments in the patterns of work. The super-users, who are supposed to instruct other users, have indeed been trained, but what has been forgotten is to adapt the patterns of work to the new system. The necessary re-alignment requires more than mere instruction. And moreover, this instruction must be broader in its scope than the purely technical operation of the new system.

- The process of securing data quality and the conversion of data from the old to the new system has been underestimated. This is often just as difficult as managing the development project itself. Typically, on top of this, neither are the users informed about the complications in connection with the conversion – for example, about what data will and what data will not be available in the new system.

- There have not been sufficient resources set aside for the training of users or for reducing the mountain of difficulties associated with the system's deployment, for example, in the form of a well staffed help desk.

- The development of the system and running of the system are handled by different purveyors. Because of this, the purveyor relinquishes the system too quickly and the company's knowledge about the system is not put to use efficiently enough for purposes of finding the 'bugs' and improving any deficiencies that will appear in the first months of the system's operation.

- The communication about the system's initial phase is too imprecise – the communication to the employees as well as the communication to the surrounding world. Consequently, mistaken expectations about how quickly the organization can achieve the optimal benefits from the system are created. This easily leads to disappointment and criticism, which in themselves only become further barriers to effective operationalization.

3.6 Recommendations

On the background of the problems that have been described in this chapter, the work group makes the following recommendations:

1. Management's responsibility with respect to the IT-project must be made fully unambiguous, and the project must be anchored firmly in the uppermost management. There ought to be one person from the management committee who will assume chief responsibility for the project. Stronger career-related or economic incentives ought to be linked up with participation in large-scale IT-projects, both for the leadership and for the employees.

2. Project management ought to – *before* a decision is made to develop the system – work up an aggregate "prospectus" that can account for the overall circumstances surrounding the project, which all parties with any interest in the project are entitled to know about. As a minimum, the prospectus ought to include:

- A clear objective, which is measurable and which can be integrated into the organization's total strategy.
- A cost-benefit analysis of the total project.
- A "feasibility-study", which maps out the organization's premises for initiating the project.
- An action plan for how - should the occasion arise - the organization can be ripened for purposes of developing and receiving the system – listing, for example, what changes in patterns of work , areas of competence and management will be required.
- A risk-assessment of the project and guidelines for the ongoing risk-control.

Early on in the process, the prospectus ought to establish a point of departure for the dialogue with employees, politicians, media and the purveyors and consultants who will come to form a part of the project's expiration. The prospectus ought to be continuously updated and ought to be used *actively* throughout the entire course of the project.

3. As a principle rule, the authorities empowered to make grants ought to require that the large aggregate IT-project be split up in partial projects with sequential deliveries. As a rule of thumb, every delivery in the project ought to run for a period of, at the maximum, six months and ought to encompass approximately 30 developers and just as many users. There has to be flexibility between the deliveries, so that the experiences from one phase can be put to good use in the ensuing one. In order to facilitate such a division, the demand specifications and project plans ought to set their focus on what business processes and patterns of work the system is supposed to support.

4. In extension of the government's promise to offer professionally qualified advice to the ministries that are now confronted with new development tasks, what ought to be ushered in is a systematic and documented collection of experiences gleaned from the individual IT-projects. The government also ought to take the initiative in establishing a network of professional, private and public-sector project leaders, who can make their experiences available for new projects. The project management itself is invested with the full responsibility for the project, but must be bound to consult this network, both in the incipient phase and later on in the course of the project.

Interaction with purveyors and consultants

4.1 Synopsis

As it appears in chapter 3, the buyer bears a great deal of the responsibility for the problems that the IT-projects have encountered. But seeing that, in most of the cases, the buyers have engaged the services of consultants and entered into business relations with purveyors who – in contrast to the buyers – can be expected to possess knowledge and experiences from other projects, it would seem that a number of the problems ought to have been avoided. And this raises serious questions – partly about the quality and the professionalism in the work of these consultants and purveyors and partly about the interaction among the three involved parties. The experiences gleaned from the investigated projects shows that the cooperative model as such is unsound on central points and also that it is far from being the case that purveyors and consultants always live up to their share of the responsibility for a successful collaboration.

Formally and juridically, the distribution of the various roles is clear enough. The buyer carries the responsibility for working out the demand specification, choosing the purveyor and managing the total course of the project – including checking on the quality of the purveyor's work. The purveyor is responsible for supplying the services as agreed upon, with the appropriate quality and on time. The buyer can choose to 'outsource' a number of technical partial functions or limited tasks to private consulting firms. These might involve assistance in working up the demand specification, the project planning or the project control, etc.

However, in practice, this 'casting' does not function as it should. The chief explanation for this is that no one of the three parts possesses the competence with respect to each other's fields that constitutes the prerequisite for such a division of labor and responsibility. That is to say, that the one part presumes that there is a knowledge about the other's part, which is in fact non-existent. For example, the buyer is typically lacking in both technical and project-specialized qualifications while the purveyor lacks insight into the processes of public administration, in general, and the buyer's organization, in particular.

The design of the contracts has further contributed to complicating the cooperation between the parts. This problem has two dimensions. In the first place, the demands on the IT-system are specified with such detail in the sales-offering material and the contract that it comes to be a straitjacket around the development of the system. In the second place, what happens is that it is *the contract's* stipulations that come to steer the course of the project. Instead of flexible project control, the result is stiff contract control. See also chapter 2.

The purveyor part also bears its own independent share of the responsibility for the teamwork-related problems in the projects. There are examples demonstrating that the purveyor has failed to meet expectations on crucial points – for example, by not supplying the technical solution that had been agreed on or by not performing his/her portion of the requisite project management. There are also several examples indicating that the purveyor has been lacking in crucial areas of competence related to cooperation, communication and organizational understanding, etc. Finally, in a number of instances, the purveyor has abstained from saying so, in a clear way, when the buyer demanded unrealistic solutions or organized the project management in an inappropriate way.

Buyers' use of consultants has - in a number of projects - been problematic. In several instances, what have been missing are a sense of *clarity* about the job and the competence of the consultant. To a significant degree, the buyer has allowed the consultant to attend to strategic and central managerial functions which in principle ought to be anchored securely in the organization's own management, and the consultants have accepted this responsibility. In certain critical phases of the IT-project, then, they have been pushed in between buyer and purveyor. The upshot of all this has been that, in point of fact, the organization's accountable management has refrained from following along and from offering their own evaluation of the projects' development. At the same time, the supervision of the consultants' work has – in a number of instances – been all too lenient. This only serves to amplify the problem.

The consultants themselves ought to have refrained from accepting this expansion of the proper scope of their job. Especially in those instances where they have accepted the responsibility of performing functions which, in point of fact, lay outside or at the periphery of their area of competence.

The aforementioned problem fields are clarified further in the following sections. The chapter will conclude with a number of recommendations about how the interaction between the parts can be strengthened in the future.

4.2 The cooperative model

The fundamental problem in the relations between buyer, consultant and purveyor has *not* been that the parties' respective responsibility in the project, *juridically* speaking, has been unclear. The terms of the contract make it evident that that the buyer is the commissioner of the job, the project leader, the owner of the completed system and the party that assumes all responsibility that the system is subsequently utilized according to the express intentions. The buyer, of course, is also responsible for

making sure that the organization is ready to make a contribution toward developing and receiving the system. The purveyor, for his/her part, is responsible for complying with the terms of the deliveries and the agreements that are specified in the contract and assumes responsibility for the project's technical quality.

But, first of all, this cooperative model builds on the erroneous assumption that it is already possible at the outset of the project to come up with a detailed and binding agreement about the entire course of the project. Secondly, there are intrinsic problems that turn up in this interaction, insofar as the formal allotment of roles presupposes that the parties possess adequately extensive knowledge about and insight into each other's professional areas of expertise and that the parties share a common understanding of the project's overall vision. But typically, this has not proven to be the case.

The occupational intersection among the three parties, in general, has accordingly been too insignificant:

The buyer possesses knowledge about his/her own organization and about the needs that the IT-project has to fulfill. On the other hand, both the technical and the specialized competence are often very limited. This entails, for example, that the users in the buyer's organization have a difficult time holding up their end of a more technical dialogue with the purveyor's developers.

The purveyor, it might be assumed, possesses the requisite technical and specialized competence. On the other hand, the purveyor typically knows very little about the administrative processes in the public-sector in general, and about the buyer's organization in particular.

The consultants typically possess specialized competence. However, they often do not possess competence that cuts deep enough to be able to supervise the quality of the purveyor's work. At the same time, it is only seldom that the same consultants are used as advisors who see one project all the way through, as advisors who have the capacity to assume the total responsibility for following and coordinating the entire process. This might constitute an explanation for why the consultants, in certain instances, have not been in possession of an adequately broad know-how. In a number of cases, even the buyer was not really clear about what the involved consultants' area of competence actually was.

This gulf between the parties' areas of competence has been a strong contributing factor in a number of the typical interaction problems that have been ascertained in our examination of the case study projects. This problem manifests itself in the following ways:

- **No one of the parties has had a thorough and total overview of the project's development – in both the technological and the organizational aspects.**

- **No one of the parties possesses the competence– or feels a sense of responsibility - for warning about** any detours in the development that may arise in the course of the project. In a number of instances, consultants and purveyors neglected to warn the buyers against choosing what were obviously risky strategies.

- **Most national buyers are "greenhorn" buyers. They face the purveyors with a certain degree of mistrust. It is a criterion of success for them to get the price down as low as possible and it doesn't seem to matter if the purveyor loses money on the job. Here, the buyer is overlooking the principle that the best deal is the one where both parts are satisfied.**

- **The contracts have been hammered out in a way that is all too detailed and all too inflexible. See also section 4.3.**

- **Too much time - with or without the service of consultants – is spent on drafting the demand specification, even though the project's final deadline is not postponed as a compensation for this delay. And frequently, this puts the purveyor under a massive pressure with respect to the deadline, right from the outset.**

- **Many conflicts - and many of them lasting a long time - turn up concerning the interpretation of demand specifications and modification proposals. How is the contract to be interpreted? Who is to have the final word on changes? How can needs be measured? How can the buyer claim a breach of contract?**

- **The buyer has pushed the consultants in between him/herself and the purveyor and, in doing so, he/she has actually handed over tasks that properly belong to the organization's central management to an external party, who does not have to answer for any political or economic responsibility. See also section 4.5.**

4.3 The Contracts

The way in which offering materials and contracts are worked out and utilized constitutes a problem of its own in the context of the interaction between buyer and purveyor.

In most cases, the demands imposed on the IT-solution are described in such a detailed way that they assume form as a straitjacket in the development phase. For example, the demand specification for Told og Skat's economic system filled up nine ring binders. The Management and Labor Authority-'s demand specification for Amanda filled "only" two. But nobody on the inside of either of these projects had any real overview of the consequences of the many demands or was capable of assessing whether the outlined system, in the final analysis, would really support the organization's objectives. This was one reason for the urgent need for changes in the projects along the way.

As has been described in chapter 2, forms K18 and K33 share a great measure of the responsibility for why the contracts have swollen up. But this is far from being the whole explanation. The wish for detailed contracts is especially due to the public authorities' perception of IT-projects as demarcated technical plant-assignments. And the logical consequence of this way of perceiving the situation is that, through a sufficiently detailed demand specification, one can design his/her way forward to a turnkey IT-system.

The detailed contracts have also fostered adverse consequences for the steering of the projects. This becomes much too colored by juridical contract control and much too little by the flexible project control that is so necessary for developing a complicated IT-system. In concrete terms, what often happens is that a project plan is drawn up on the background of the contract's demands. It would be a much better idea to hammer out a project plan first and let this serve as the foundation for drawing up the contract.

The regulations concerning offerings contribute toward exacerbating the problem, because they operate with very short time limits for purveyors, typically 37 days. This is a minimum time limit. In practice, however, it functions as a maximum. Frequently, because a great deal of time was used for working out the demand specification, the buyer is actually operating under enormous time pressure. For this reason, the purveyors are asked for a hasty estimate, which they then have such difficulty in managing to satisfy in a proper fashion. Experiences from the case study projects clearly show that from the outset, the public-sector buyers ought to take as their mark the notion that all the demands on a system cannot be determined beforehand. There has to be room for flexibility and for changes to be made along the way in the course of the project. Detailed contracts should therefore be replaced by more open contract forms, which can serve to motivate both the buyer and the purveyor into carrying on an ongoing collaboration concerned with finding the optimal solutions. Naturally, within the overall frames and objectives which have been set up.

The contract ought to contain more well-elaborated principles for the cooperative process, including making it clear who it is that will be deciding about changes, how the needs can be measured and what process-related demands have to be imposed on the project's control. It also ought to be possible, after the contract has been signed, to draft common demand specifications – with the possibility of stopping the collaboration. This would serve to strengthen the common understanding of the problems and of what the finished system will be able to do.

Moreover, it would strengthen the projects if the contracts did not merely operate with penalties, but also with positive incentives.

Instead, what we see today is an inordinate degree of energy spent on assessing whether there might be a situation that ought to incur a penalty. Energy which in many instances would be more wisely spent on getting the projects done. Experiences from other countries also suggest the possibility of making use of project competitions of a kind. The procedure sometimes goes like this: a number of different purveyors are invited to come forth with a total bid on the design of the new IT-system. The buyer can then choose between the submitted proposals before the project is dispatched further in the legitimate offering. It is the perception of the work group that the design proposals, in a number of instances, will constitute a valuable tool for qualifying the buyer's wishes with respect to the new system. A project competition can also play a part in indicating where the public-sector buyer has to ripen his/her organization before the actual work on the system development is set into motion. See also the recommendations in section 4.6.

4.4 The Purveyors

Offering an evaluation of the purveyors' IT-specialized competence and identifying any potential breaches of the contracts - in a juridical sense - lie outside the scope of this work group's assignment. However, statements made by key players in the case study projects indicate that in at least three areas, the purveyors certainly carry their share of responsibility for problems that the projects have run up against.

First of all, in several cases, the purveyor was either incapable of supplying the agreed on technical solution or has furnished such inadequate project management that this has been a strong contributing factor to the project's getting sidetracked.

Secondly, the purveyor part has frequently failed to develop the "soft competences". In several projects, the purveyors have been lacking in the volition to understand the organizational aspects of the IT-project, to cooperate with other purveyors, to communicate with non-technical people and to react to problems that are in the offing.

Thirdly, in some cases, the purveyors have performed their parts in a manner that can only be described as problematic. This applies especially to the following points:

- **The tenderers have deliberately given a bid for the project that was too low. This has ostensibly been done with the expectation of being able to gain the necessary profits as a result of the buyer's requests for changes in the delivery along the way in the course of the project's development or when the system is first put into operation. For this reason, the purveyors have also stuck very meticulously to the terms of contract.**

- **In the proposition phase, the purveyors have affiliated their most proficient project leaders and salesmen. However, these staff members were replaced later on by lower ranking employees, *after* the contract was signed.**

- In the phase of tendering, the purveyor has not lived up to his/her ethical responsibility to say so, in a clear and distinct way, when it is obvious that the technical demands from the buyer's side are inexpedient. Among other things, this can be due to the fact that unfortunately, some public-sector buyers consistently reject proposals where the purveyor expresses reservations about a third party's software or about unrealistic demands in the offering materials.

- After the contract has been entered into, the purveyors have also failed to live up to their part of the bargain by *not* indicating clearly enough that the buyer's organization and staffing of the project is inadequate or that certain basic things, like risk-assessments, are missing from the project. In one of the projects covered by our investigation, *all* of the buyer's project participants (including the project management) were only connected to the development project on a half-time basis. Here, the purveyor ought to have called specific attention to the fact that this would tend to weaken the buyer's position and also render the requisite collaboration between the parts all the more difficult.

- In at least one instance, the purveyors have neglected to promptly forewarn the buyer that the project's technological bases – as seen in the light of the general development – were about to change in their basic character. It ought to have been the purveyor's job to furnish the buyer - on an ongoing basis - with up-to-date relevant knowledge that would make it possible to assess and to steer the technical risks of the project. In the Amanda-project, for example, it was the customer who continually had to ask the purveyor about the ongoing development and the upkeep of the control system (OS2) and the development tool (HPS). In the opinion of the work group, it ought to have been the purveyor who, on the basis of his/her own inclination, informed and counseled the customer about crucial technological developments and changes.

- In several instances, the purveyor has neglected to inform the buyer that the development of the system was delayed. For example, in one project, the buyer knew long in advance that the purveyor would not be able to deliver the system at the appointed time. But out of a misguided lack of confidence in the ongoing collaboration, this question was never clarified until the purveyor had to eat humble pie – just before the deadline. This kind of thing merely weakens the confidence in the purveyor's project control and plays a part in forcing the buyer to employ contract control rather than effective project control.

4.5 The Consultants

In all of the case study projects, external consultants have played an important role. This is partly due to a scarcity of employees working in the public-sector who possess the technical and specialized areas of competence and partly due to the fact that the appropriation process indirectly favors the use of consultants over the use of staff employees. See chapter 2.3. The consultants have either fully or partially been entrusted with the responsibility of hammering out the demand specification, carrying through the business surrounding the offering, carrying out the risk-assessment and the contract control, assessing the system when it is taken over and advising about operationalization. The consultants have also supplied less specialized manpower on concrete tasks associated with the projects.

It is the assessment of the work group that the public-sector buyers have been much too permissive in allowing the consultants to attend to strategic and central functions, which principally ought to be anchored in the organization's own management. The management apparently regards consultants as a good insurance against third-party risks, who can cover the organization when it comes under fire in difficult situations. "We were only following the recommendations of the consultant." In a number of projects, the consultants have thus attended to managerial tasks inside the buyer's organization, sometimes acting as project leader or project coordinator of the overall development project. In some of the projects, the managerial responsibility has virtually been awarded to the consultants when the buyer's own organization has proven itself - along the way in the course of the development - to be incapable of getting the job off the ground. This use of consultants can be necessary in an emergency situation, of course, but for a number of reasons, it sometimes seems inappropriate:

- The consultant cannot take over management's jobs and responsibilities.

- Typically, the consultants are not sufficiently familiar with the customer's organization and procedures. For the consultant, then, it will often be difficult or impossible to sort through the user groups' modification proposals. And after all, it is the management of the organization who subsequently has to live and work with the system. The same thing cannot be said about the consultant.

- The knowledge and insight that the consultants cultivate around the project vanishes into thin air when the agreement with the consultant comes to an end. Since the consultant is only attached to the project in certain phases, what is learned in the phase spanning from the offering round to the development stage is not carried over into the phase spanning from the development to the operationalization. For this reason, valuable know-

ledge is squandered and the public-sector organization fails to build up any lasting competence in these areas.

It is also a mistake when consultants are used as intermediate link between buyer and purveyor. In a couple of the case study examples, during critical phases of the project, the consultants were wedged in between the parties as negotiator and representative for the buyer. The result of this was that the organization's responsible management more or less gave up any attempt to follow along with and to assess the project's development to any sufficient extent.

Furthermore, on the part of the consultants there is not the necessary continuity in the course of the project. What is typically the case is that one consultant draws up the demand specification but does not take part in the subsequent phases of the project, when other consultants – often from other firms – take over. This makes it difficult to hold the consultants to the advice they have given. A shift of consultants also entails a shift in project methods in the dialogue and cooperational forms. In several cases, this has led to unplanned and uncoordinated shifts in method along the way in the course of the project and has entailed that the knowledge and decisions are not carried over from one phase in the project to the next. Experiences gleaned from the investigated projects evince that inconvenient ruptures or problems often arise in the shifts between different consultants.

At the same time, the supervision of the consultants' work has generally been too lenient. The buyer has been too eager to regard the consultants as "friendly helpers" instead of as "purveyors of commercial services". Typically, contracts with the consultants are therefore less specific and less binding than those entered into with the purveyors. If the liability stipulations and the expectations of the consultant's role are not made clear from the outset, it will be difficult for the buyer to subsequently make a consultancy-liability applicable.

In reality, it is just as important to steer the consulting assistance as it is to steer the other parts of the total development project. Many problems in the IT-projects can be connected with the fact that consulting firms have been given free rein. Among other things, the buyer has neglected to pose firm demands on the quality of the consultants' work, for example, by being more explicit in writing the consultancy-liability right into the contract.

Accordingly, there are essential problems in the buyer's use and the buyer's supervision of private consultants. But there are also a number of critical points that have to pointed in the direction of the consultants:

- **They have not demarcated the consultant's role in a sensible way, and have sometimes accepted important managerial responsibility.**

- **They have drawn up IT-strategies and demand specifications for some of the IT-projects that subsequently ran into serious problems. The consultants' advice has in some instances not been good enough. This has to do, among other things, with recommending moving ahead with the project as one huge project without partial deliveries. What has also been dubious is whether the consultants have paid a sufficient degree of attention to the project's organizational aspects and the potential risks connected with the technology's development.**

- **The consultant enterprises have, to a considerable extent, allowed their top talent to sell and prepare the job while letting less experienced employees assume responsibility for the execution – without making it clear to the buyer what areas of competence and experience these people had in the various fields.**

4.6 Recommendations

On a background of problems pertinent to the interaction with the purveyors and the consultants, which have been described in this chapter, the work group puts forth the following recommendations:

1. The construction and exchange of experiences involving public-sector IT-projects, which is recommended in chapter 2, also ought to encompass experiences with the cooperation of the individual purveyors and consultants, with their areas of competence and with the quality of their work. This will constitute an important basis for the public-sector's capacity to coordinate its purchases of IT- and consultancy services and of posing clear demands to the purveyors with respect to the same.

2. More flexible contract models, which reflect the realities in modern IT-projects, ought to be put into use. The contracts ought to supplement, to a greater extent, the necessary penalty provisions with a series of positive incentives.

3. Experiences with utilizing so-called project competitions in order to qualify the buyer's design of the IT-project ought to be accumulated. The model would presuppose partly that the rules of this area can be administered in connection with large-scale IT-projects and partly that the government will be willing to award sufficiently large prizes so that it would be attractive to take part.

4. In collaboration with the government, the IT branch associations and the consultancy concerns ought to hammer out and maintain a *code of conduct* for the cooperation of large-scale IT-projects in the public-sector.

5. What possibilities there are for employing and holding on to especially qualified project leader and key IT-personnel in the service of the government ought to be seriously investigated.

Practical advice for future IT-projects

This appendix gathers together some important *practical advice* for the leaders who will be heading up large-scale national IT-projects in the future. These pieces of advice are built up partly on the basis of the five projects under investigation and partly around the experiences of members of the work group with developing, piloting and participating in large IT-projects. The practical advice thus implies, also, a strategy of putting the recommendations made in this report's chapters, 2, 3 and 4 into practice. The more *general* and *political recommendations*, however, have not been incorporated into this appendix.

The pieces of advice are classified according to which of the following themes they specifically address:

- Maturation of the organization
- Technology and frameworks for national IT-projects
- Organization of development projects
- Interaction with purveyors and consultants

The list of practical advice is not exhaustive – for example, when there is a wish to explore methods of project control, the work group refers the reader to the current literature. But it can serve as a useful checklist for the management that has been charged with the overriding responsibility for a project. The following list can be an aid in setting focus on those areas where previous experiences have otherwise too frequently been overlooked or have been dealt with in a patently unprofessional way. What is especially relevant is to pay close attention to the bits of advice at the *beginning* of a development project, this means to say, *before* the contract is signed. Many of these points ought to be checked again and again, and continuously, throughout the entire course of the project.

The literature list contains a number of other publications where experiences with and recommendations for IT projects in the public-sector can be found.

Practical advice	Check
The maturation of the organization:	
1. The following questions have to be answered before the development project is put into action:	
• What is the real need for the project?	
• Can the project be carried out?	
• How will we get ready to carry out the project and the organizational re-alignment it entails? The answer to these three questions ought to make it clear to the organization's management just what needs the system is supposed to meet and what it will require of the organization to implement the developmental project.	○
2. The project will have to be firmly anchored in the uppermost management, Here, there must be one person from the management direction who will assume chief responsibility for the project. Management's responsibility for the success of the IT-project is thus rendered clear and unequivocal.	○
3. Early on in the course of events, the assignment's commissioner or project management ought to work up an aggregate "prospectus", which will provide information about the overall circumstances surrounding the project, about which the project's interested parties have a right to know. As a minimum, this prospectus ought to include:	
• A clear goal, which is measurable and integrated into the organization's total strategy.	
• A cost/benefit analysis of the total project, so that whether or not there is sufficient documentation for the project's aggregate benefits is visible from the outset.	
• A plan of action for how the organization can be ripened for purposes of developing and receiving the system. This plan ought to subsume both how the organization can achieve a common understanding of the project's requirements and what areas of competence need to be built up. There must be a special focus on the organization's capacity for establishing and driving a project organization.	
• A risk-assessment of the project and guidelines for the continuing risk-control.	○

Practical advice	Check	Practical advice	Check

4. Experiences from similar public-sector IT-projects must be acquired. What must be evaluated especially in relation to the organization's own project plans are the experiences of others in areas such as maturation of the organization, management, user involvement, risk-assessment, regulations concerning offerings and the project's success and experiences with selected collaborators. ○

5. The management must wait until the preliminary conditions are all in place before putting the project into action. Among other things, this involves that the organization must have the necessary resources and areas of competence at its disposal for getting the assignment off the ground. ○

6. The necessary adaptation of the organization and its working procedures must transpire in parallel with the development of the system – and not first when the system is to be put into use. ○

7. It has to be made clear to the members of the staff, from the very outset of the project, if there:
- are working processes that must be re-adjusted
- are going to be changes in the service level
- are going to be new products/services introduced
- are going to be changes in the size or the composition of the personnel
- are functions that will be centralized, decentralized or done away with entirely. ○

8. The advantages of the new system ought to be realized as quickly as possible, after it has been put into operation.
The more time that passes, the more difficult it becomes to realize the propounded success criteria and to assess whether or not the system has strengthened the organization's business-related goals. ○

Frames and technology:
9. The point of departure for the design of the system ought to be that it must be as small as possible – following the adage "think big – start small". ○

10. The management and the authorities empowered to make grants ought to ensure themselves that the new system will contribute to the organization's attaining its goals. Another thing that must be evaluated very seriously is whether such goals can be attained by using standard software or by recycling elements of other public-sector agencies' systems. ○

11. The aggregate IT-project must be split up into partial projects with continuous deliveries. As a rule of thumb, every delivery in the project ought to run over a time-period of – as a maximum - six months and every delivery ought to involve not more than about thirty developers and an equal number of users. The partial projects ought to be autonomous, demarcated and serviceable parts of the total solution, which can be implemented in steps. ○

12. The developmental project must be arranged according to what business processes and procedures the system is going to be support. Project plans, demand specifications, etc. have to be taken into account for this reason. ○

13. The project plan ought to establish the basis for a flexible contract which can serve to motivate both buyer and purveyor to cooperate – over the course of the entire project - on reaching the most optimal solutions and can ensure that this cooperation is based on project control more than juridical contract control:
- Room must be made for changes that might turn up along the way
- Clear principles for the cooperative processes must be set up, including the stipulation of who has the responsibility for changes, how the needs are going to be measured and what requirements are to be set up for the project control as well as the buyer's and the purveyor's staffing of the project.
- The contracts must not operate only with penalties, but also with positive incentives and bonus schemes. ○

14. It is the responsibility of the organization's management and the authorities empowered to make grants to keep up-to-date on the topic of risk-assessments and to make sure that risks be eliminated or limited. If the IT-project in question subsumes a number of different institutions, it is especially crucial to take the risk-assessment into account. ○

Practical advice	Check

15. Early on, the project management has to outline a communication plan that will ensure a thorough, continuous and open flow of information about the project, internally within the project organization, throughout the whole of the larger organization and outward to the media and the public eye. ◯

16. Pilot studies with the new system must be made, which also ought to include tests of new procedures and tests about whether the personnel have been adequately introduced to - and have had a sufficient degree of instruction in - the new system. If it proves impossible to run pilot tests, mention of this ought to enter into the risk-assessment. ◯

17. Systematic evaluations of the project ought to be carried out and the experiences must be made accessible to those planning new projects. This will make it easier for coming projects to compare their project plans with projects that have already been implemented. ◯

Organization of the development project:

18. Over and above the project leader and the person invested from management charged with the chief responsibility, the project management ought to consist of a steering committee which will bear the responsibility for the overall strategic decisions. ◯

19. The assignment of responsibility and roles must be described for all the involved parties. ◯

20. Project plans, prospectus, etc, have to be evaluated and quality-controlled by experienced project experts. Their assessment ought to enter into the aggregate risk-assessment of the project. ◯

21. It is imperative that the project organization be systematically staffed by the most proficient project leaders and personnel. Stronger incentives for participating in the IT-project have to be set forth. These could be achieved, for example, by developing attractive career pathways for the participants – especially the leaders. ◯

Practical advice	Check

22. Super-users ought to be called into the development and ought to be charged with an independent responsibility. It ought to be the most proficient and most responsible core-users who will be called in on a full-time basis. ◯

23. The role and the responsibility of the user groups must be made clear from the outset. It is crucial that the project management consistently assess and prioritize the users' needs in relation to both the technical design and the success criteria for the aggregate project. ◯

24. An ongoing cost/benefit assessment ought to ensure that new wishes are counter-balance by asking whether less important wishes or needs can be omitted. ◯

25. The instruction of the users must not include only the coming super-users and the instruction must be broader than the technical operation of the system. The new procedures, new services, new cooperative forms and the new intentions behind the changes must be part of the training. ◯

26. The end-users' management ought to ensure that the expectations of the new system tally with the system's real possibilities. Among other things, this has to do with complications connected to the conversion of data and the question of how rapidly the system can attain its goals. ◯

27. It is important to handle the further development of the system just as precisely as the development process itself has been handled. The system's business-related goals must be secured as control implement. ◯

Interaction with purveyors and consultants:

28. The practical allotment of roles between buyer and purveyor must be carefully documented. Over and above this, joint activities for the two parties ought to be scheduled, with an eye toward engendering a joint understanding of the project's goals. Such activities will have to be repeated after every large partial delivery. This can ensure the close and trustful cooperation between buyer and purveyor, which constitutes a prerequisite for a successful project elapse. ◯

29. The crisis handling of the project ought to maintain a focus on the project's business goals and cost/benefit. It ought to ensure that both parts are working constructively to find the very best solutions even if such solutions may not be situated within the letter of the contract.

30. The purveyor of the system must assume responsibility for the running of the system during the initial period in order to rectify those errors and deficiencies that typically crop up in the first few months of any system's operation.

31. The relationship of responsibility and the expectations of the consultant's role and proper task must be made fully clear from the outset and must be reflected in the contract between the various parties. It is just as important to steer the consultancy assistance as it is to steer the other aspects of the aggregate developmental project. For this reason:

- The consultants must document their qualifications and experiences specifically in relation to the task that is to be solved.
- The contract has to contain names of the key consultants who are going to be solving the assignment. Any subsequent deviations from the contract, in this respect, will have to be approved by the buyer, so that the consulting firm will not be advancing less qualified resources in the implementation of the project.
- The buyer must guarantee a proper transfer proceeding should there be a shift between different consultants along the way in the course of the project.
- It is the sole responsibility of the buyer to attend to the strategic and central managerial functions, so that the managerial responsibility is firmly anchored in the organization.

The five case studies

Together with the personal experiences of the work group, the examinations of the following five projects have constituted the foundation for the work group's efforts.

The five projects are described here in brief – with a special focus on their contents, purposes, construction, price and lapse of time. The descriptions here do not examine the extent to which the finished systems have fulfilled their original intentions.

Told•Skat's Business system

The business system was developed by Told•Skat [the Custom and Tax Authority] as a direct consequence of the fusion between the Internal Revenue Service and the Directorate for the Customs Service. The aim was to create a system that could replace the two older IT-systems, which the respective organizations had developed for their own use. The business system was a smaller part of a more comprehensive IT-modernization, which also involved the replacement of hardware.

The business system was supposed to register information about business enterprises and also to take care of accounting and bookkeeping, collections, and the monitoring of taxes and expenditures for business enterprises. The system was supposed to foster a better and more cohesive administration and a more effective task-solution.

The original plan was that the business system would consist of five partial systems: registration of businesses, tax returns and declarations, selection, planning (etc.), accounts and arrears.

The project was ushered in - in 1995, when the contract between the external purveyor, Datacentralen (later on, CSC) was signed. The expenses for the project were originally estimated to be 150-200 million crowns, which was to be financed on the basis of funds taken directly from Told•Skat's budget for operating expenses.

According to the terms of the contract, the planned project was to have been delivered by June 30, 1997. In the spring of 1997, the project was significantly pruned, and the original time frames were changed. The development of four of the five partial systems was abandoned, with the result that only the "registration of businesses" was fully developed and eventually implemented. The abridged system was delivered on June 14, 1999. The adjustments of the system continued up until the beginning of the year 2000, when it was finally put into operation.

According to The National Audit Office, the business system in its trimmed-down form ended up costing Told fh Skat 129.3 million crowns – that is to say, just a little bit less than the amount for which the original project – with five partial systems – was budgeted.

EASY

Erhvervsskolernes Administrative System [The Trade Schools' Administrative System], EASY, was developed against the backdrop of a cooperation between the trade schools and the Ministry of Education. It was conceived as an implement for solving administrative assignments at the nation's trade schools. EASY is a further development of an earlier system, system, ESAS, and is the smallest IT-system of the five case study projects that the work group has investigated in the present report.

The contract with the purveyor, WM-data, was originally set at 25.5 million crowns. It was signed in May 1996, with an operationalization targeted for June 1998. At the conclusion of the design phase, the purveyor reported that the system had expanded by 42% with respect to the demand specification. The reasons for this were ostensibly due in part to the work with the actual system description and due in part to new legislation in the area. A group was appointed for the task of reducing the system's functionality, and the outcome of these efforts was a revised plan that lay 33% over the demand specification. It simply wasn't possible to remove any more without re-designing large elements. The contract with the purveyor was consequently increased to 32.7 million crowns. The basic project was financed by a special annual budget account, while the increase was financed by funds from the ministry of education's trading account.

In the autumn of 1998, the EASY-project ran up against problems with data conversion, as the system was about to be put into operation. The problems aroused some considerable degree of attention in the press, especially because some of the institutions' students were running the risk of not being able to receive their diplomas upon successful completion of the degree requirements.

The operationalization of the system remained pending at the nation's business schools for a period of three months, until the spring of 1999, at which time the system was implemented as planned.

Amanda

Arbejdsmarkedets Nye Database [the management and labor authority's new data base], Amanda, was put into operation by the management and labor authority as a consequence of the labor market reform which took effect on January 1, 1994. It was the intention that Amanda replace AF-Match, the IT-system that the unemployment offices were using at the time.

One of the aims of Amanda was to better match the labor market's need with the qualifications of unemployed citizens. The IT-system ought to be adapted flexibly enough so that the 14 regional

unemployment offices could preserve their own various ways of organizing their work.

The development of the integrated system was set into motion in June 1996. The economic framework around the project was originally slated at 268 million crowns.

After a few months of development, the purveyor, CSC, was compelled to abandon the original goal of tailoring the system to be able to accommodate the different procedures of the different regions.

According to the plan, the system was to have been put into operation on January 1, 1998. As things came to pass, the system was first put into operation on April 10, 2000 – under a considerable degree of critical media attention. In the ensuing months, the system fostered huge problems for the performance of tasks in the regional unemployment offices, since the personnel's time spent on the performance of the individual tasks rose sharply with the use of Amanda. The consequence was that in the months following the deployment of the system, productivity was cut in half, and what arose was a great degree of frustration between the staff members and the users.

When the National Audit Office examined the Amanda project in 2000, its total costs were computed to be 412.2 million crowns.

On May 31, 2000, the Ministry of Labor appointed a committee with three experts in order to assess what could be done to optimize the system, both in the short-term and the long-range perspectives. In October 2000, the expert committee concluded that it would be necessary to supply an additional 120 million crowns if Amanda was going to function reasonably well. Of this amount, 60 million crowns would be used for purchasing new hardware. The management and labor authority has chosen to follow the recommendations of the expert committee.

Navision Stat
The Navision Stat project was initiated by the Agency for Governmental Management. The goal was to establish a fiscal system that would supersede the Statens Centrale Regnskabssystem, SCR, as the national institutions' economic bookkeeping and accounting system. Navision Stat is actually a re-adjustment of Navision Financials, a standard system.

The IT-system is installed in the individual institution in a basic version, which the institution in question pays for in direct proportion to the sum of its salaries. Subsequently, the institution can make its own use of the standard system's expansion and integration potentials. It is the individual institution that assumes the sole responsibility for the running of its own Navision Stat system.

Implementing the system in the individual institutions has proven to be more demanding of resources and time than was first presumed. In November 2000, the Agency for Governmental Management was consequently forced to expand the budgetary

framework from 70 to 110 million crowns. As part of the Annual Budget for the year 2001, the Agency for Governmental Management was granted the authority to draw on funds from its own savings to defray the additional expenditures.

As of January 1, 2001, Navision Stat was operating in 113 out of approximately 500 institutions. The current expectation is that the implementation will be finalized by the year 2003, at the latest.

VUE
The project with the Videregående Uddannelses-institutionernes Edb-systemer [higher learning institutional computer-systems], VUE, was developed by the Ministry of Education as a common administration system for the nation's universities. The VUE-project subsumed both the development of an institutional system and a modernization of the existing central systems in the Ministry of Education (UNI-system). The institutional system consisted of a fiscal supervision system (ØSS) and a studies-administration system (STADS).

The project was initiated in 1991 with a special eye to being able to follow the university employees' time consumption with respect to research, teaching hours and administration. Along the way, however, these intentions were altered with the result that the system was now primarily designed for handling the administration of the students attending the nation's universities.

Originally, the project was supposed to have been put into operation in 1994. But as a result of a petition presented in 1993, the deadline was changed to 1995. The fiscal supervision system (ØSS) was gradually put into operation from January 1, 1995 and STADS was put into operation at the first of the institutions on April 1, 1996. The basic version of the system was delivered on November 1, 1996 and it was running by the first day of 1997. Further developments in the system, however, were going on in the ensuing years.

Up through 1994, the VUE-project was working with ordinary annual budget appropriations, including an extra petition appropriation in 1993 of about 30 million crowns. The individual institutions' expenses were defrayed within their own frames. From the year 1995, when the fiscal supervision system was put into operation, the annual budget for services and development granted funds to the VUE-center (as a national institution). In the middle of 1995, it proved necessary to apply for extraordinary petition-appropriations of about 18 million crowns in order to get the development of STADS complete by 1995/96. In the summer of 1995, the VUE project was reorganized. Ever since that time, the VUE systems have been financed through the VUE center's appropriations and through user-payments. Upon the reorganization, the Ministry of Education provided the institutions with the possibility of opting not to make use of the studies-administration system, STADS, under certain circumstances.

At the end of 1996, the purely developmental expenses for both systems, according to the Ministry of Education, could be computed to around 129 million crowns. From the year 1996, the further development and maintenance of the VUE systems have been financed by the VUE center's own appropriations and by user-payment. From the year 2000, the universities have established their very own purchasing association, which runs and maintains the systems.

Today, the system administers only about 40% of the students at institutions of higher learning in Denmark. Both the University of Copenhagen and the Copenhagen Business School have chosen not to take part and have developed their own systems.

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