

The Legal Status of Software in Use in State Bodies

A review of information
systems



RÍKISENDURSKOÐUN

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Introduction

Software producers normally hold the copyright on their software and permit others to use it in return for a fee. The rules applying to the authorisation to use software vary according to the type of software and the producer.

It is frequently the case, in Iceland at least, that copyright on software is not respected. Consequently, a large amount of the software that is in use has been copied illegally, either by accident or on purpose.

On 20th January this year, the Minister of Education signed an agreement on behalf of the Government of Iceland with the US software company Microsoft under which Microsoft undertook to translate the Windows 98 operating system into Icelandic, in exchange for which the Government undertook to put an end to the use of illegal software by state bodies by the end of 1999. After the agreement was signed, the Minister asked the National Audit Office to investigate the use of illegal software by these bodies. This report presents the findings of this survey, and also includes some information on copyright and the main types of copyright infringement. This is done in order to increase awareness and understanding of these matters within state bodies.

The National Audit Office wishes to thank the many individuals, both within the civil service and outside it, who assisted it in different ways with the implementation of the survey.

National Audit Office, 15th December 1999

Principal conclusions

- Main reasons for the existence of illegal software
The most common reasons why software in the survey was found to be illegal were:
 - Software had been installed in more computers than were covered by the licence.
 - There was a misunderstanding concerning payment for shareware.
 - Shareware was wrongly classified as freeware.
- Legal status and estimated value of the software
The survey revealed the following:
 - 40.3% of the software in use was legal; its value was estimated at c. ISK 700 m.
 - Illegal software for which the respondents intend to purchase licences, or which they could not explain, amounted to 8.8% of the total, with an estimated value of c. ISK 150 m.
 - The legal status of 19.1% of the software that it is planned to delete is unclear. The value of this software is estimated at nearly ISK 300 m.
 - The legal status is 31.8% of the software could not be established. It was valued at ISK 550 m.
- The overall situation
When the replies to the survey questionnaire are examined, it is striking how widely the situation regarding software licensing varies from one state body to another. It is clear from the documents submitted that some of them have a strong sense of responsibility and have adopted a policy of preventing the use of illegal software; the situation at these institutions is good. Certain things in the course of the survey, including conversations and responses of various types, indicated that other parties put rather less emphasis on attending to these matters. In many cases, however, it was clear that this lack of emphasis was due more to ignorance than to a lack of desire to have things in proper order. In the case of those parties that submitted little or no material to the National Audit Office, or did not answer the

questionnaires it sent out, the situation is not known.

- Not all hardware at state bodies included
The survey covered only the EXE , COM and SYS files that were recognised by the GASP system and had been installed in personal computers (PCs) with DOS, Windows, Mac/OS and OS/2 operating systems. Thus, software in PCs with other operating systems, and software in larger computers at the state bodies was not included in the survey.
- Number of state bodies
Initially, the National Audit Office identified 322 bodies under Sections A, B and C of the state budget that were to be included in the survey, and sent them material for Phase 1. 17 bodies either replied jointly with others or did not have computer equipment; 278 submitted materials for Phase 1 and 27 either submitted only partial materials or failed to submit materials. In Phase 2, 242 parties, or 75.2% of the original group, submitted satisfactory replies.
- Number of computers
In Phase 1, materials were submitted concerning software installed in 8,357 computers. The National Audit Office estimates that 2,943 computers are not covered by the survey, which therefore should have included 11,300 computers.
- Number of program copies
The findings of the survey were based on 76,347 program copies listed in questionnaires submitted in Phase 1. The National Audit Office estimates that an additional 20,601 copies are not covered by the survey, which therefore should have included 96,948 program copies.

1. Scope of the Survey

1.1 The Incentive for the Survey

The incentive for the survey is to be found in the agreement of 20th January 1999 between the Government and Microsoft. This included a provision stating that the Government would take steps to investigate the use of illegal software in state bodies.

On 22nd January, the Minister of Education, on behalf of the Government, requested the National Audit Office to carry out the survey. For this to be possible, it was necessary for employees of the National Audit Office to acquire knowledge of the rules applying to copyright in software and the main methods used in software piracy, whether or not infringements of copyright are committed by accident or on purpose.

It is important that state bodies, no less than other parties, should respect copyright in software. For this to be possible, those involved must know some of the basic features of copyright in software. It was therefore decided that this report would cover two areas: the findings of the National Audit's survey of the use of illegal software in state bodies, on the one hand, and informative material on software copyright and the main infringements of it, on the other.

1.2 The use of special software

The National Audit Office could have based the survey discussed here on a manual examination of a few state bodies selected by random sampling. Such a method would probably have given a fairly reliable picture of the situation regarding software licensing, and would also have been relatively simple to implement. However, it was not considered viable to conduct this survey on the basis of

samples because the agreement between the Government and Microsoft provided for all illegal software being deleted from the state's information systems by the end of the year. For this to be possible, it was necessary to investigate the state of affairs in the information systems of all state bodies.

The National Audit Office regarded it as impossible to investigate the use of illegal software in all state bodies in the short time available without using software specially designed for this purpose. Several software packages were examined, and the one chosen was GASP from Attest Systems, Inc.¹ It is designed to investigate the use of illegal software, and includes a listing of the software installed in each computer.

1.3 When was the survey made?

The agreement between the Government and Microsoft included a provision that the survey of the use of illegal software was to be completed in May 1999. For various reasons, however, the survey lasted from mid-April to early December 1999.

As soon as the National Audit Office undertook to carry out the survey, it began looking into software to use to facilitate the task. It proved to be far more time-consuming than had been expected to find software that met the National Audit's requirements. Thus, it was not until 12th April that materials were sent out in Phase 1 of the survey, which focussed on the collection of data on software installed in computers in state bodies. The deadline for the return of these materials was 23rd April 1999.

On 20th April the National Audit Office received a letter from the Data Protection Commission stating that a complaint had been lodged with the commission because an employee of an unnamed state body considered that the survey violated the Data Protection Act, No. 121/1989. The National Audit Office did not share the view that the survey involved the collection of personal data of the type covered by the act. The National Audit Office replied to the Data Protection Commission to this effect, and giving full reasons,

¹ See www.gasp.com

three days later. After that date, the person who had brought the complaint was given a month in which to express his views on the arguments presented by the National Audit Office.

The Data Protection Commission delivered its ruling on 1st June; this is published in Section 2.2.1.1. of this Report. The substance of the ruling was that the project did not involve the gathering of personal data in the sense of that term as used in the Data Protection Act, No. 121/1989. Thus, the Data Protection Commission had no objection against the survey proposed by the National Audit Office of the extent of the use of illegal software in state bodies.

It was clear that the complaint to the Data Protection Commission had an effect on the progress of the survey. The National Audit Office is aware that many parties waited until the commission had made its ruling before gathering data with the GASP software. On 27th May, more than a month after the deadline for submitting data for Phase 1 had passed, only 139 out of 322 parties, i.e. just over 43%, had done so.

On 2nd June 1999, the day after the Data Protection Commission had made its ruling known, a letter of reminder was sent out to all those who had not yet returned data for Phase 1. They were urged in the letter to submit data not later than 7th June. The relevant ministries were also informed of this reminder; and most of them responded promptly by contacting the bodies under them and encouraging them to submit data.

Materials for Phase 2 of the survey were sent out on 24th September. These included a questionnaire concerning licences for the software that had been found installed in Phase 1. Only those who had submitted data in Phase 1 received this material. The deadline for returning the questionnaire was 25th October. By that date, only just under a third of those who had received the questionnaire had returned it. A reminder concerning the submission of data under Phase 2 was sent out on 3rd November.

Right from the time that materials were first sent out on 12th April until the final version of this report was prepared, responses were still being received from state bodies in connection with both

Phase 1 and Phase 2 of the survey. No further processing of Phase 1 materials took place after 26th November, or of Phase 2 materials after 9th December.

1.4 Restriction of scope of the survey

1. Only computers with certain operating systems covered

The National Audit's survey of the use of illegal software extended only to the EXE , COM and SYS files that were recognised by the GASP system and had been installed in computers with DOS, Windows, Mac/OS and OS/2 operating systems. Thus, software in computers that run on other operating systems, and software in the larger computers used in state bodies was not covered in the survey.

2. Remote survey of servers

Using programs directly on a server when the server is in use can be dangerous for various reasons, e.g. because of the danger of interference with its functioning if this is done in the wrong way, and also from the point of view of security. Therefore, GASP was run on a workstation which checked on the software installed in the relevant server. The drawback to this was that if the person carrying out the survey did not have access to all the programs on the server, then the check did not include all the programs installed in it. This happened in some instances.

2. Preparation and Execution of the Survey

As has been described above, the National Audit Office carried out the survey from the end of January until the beginning of December 1999. Below follows an account of matters connected with the preparation and execution of the survey.

2.1 Preparation

Initially, the preparatory work included an investigation into whether information on the state of affairs in state bodies was available. For this purpose, a check was made of both the National Assets Management System and the National Accounting and Planning System (BÁR). Neither proved to be of use, and other methods of carrying out the survey therefore had to be found. The reasons why the two aforementioned data systems were not of use with the execution of the survey are discussed in the next two subsections.

1. The National Assets Management System

Article 15 of the National Finances Act, which deals with off-balance-sheet assets states that each year, a special register of fixed tangible assets (property, plant and equipment) is to be drawn up; this is to be itemised by asset categories and the conclusions are to be published with the national accounts.

As with other statements of a financial nature that state bodies are required to prepare, the State Accounting Office is in charge of the National Assets Management System. As

software does not constitute material property that the state bodies could re-sell, the State Accounting Office had not instructed them to enter it in the register as an asset. This is why it was not possible to use data from the National Assets Management System in carrying out the survey.

2. Accounting Codes in the National Accounting and Planning System (BÁR).

In order to obtain comparable data on individual aspects of operations in all state bodies and companies, the same accounting code is used to specify categories in the National Accounting and Planning System (BÁR). Only two accounting codes could be considered in connection with software. They are presented below together with the explanations given by the State Accounting Office regarding their use.

5218 Software (minor units)

“All minor units of software, e.g. various ready-made software packages purchased in shops, are to be entered here.”

5814 Computer equipment

“All major types of computer equipment, e.g. computers, software and circuit installations, are to be entered here. Various smaller accessories for computers shall be entered under accounting code 5258”.

The above accounting codes proved to be of little use in connection with the execution of the survey, because software is not specially classified under a single code. It should be pointed out that in those cases in which software is sold together with computer hardware as an indivisible whole, it is sometimes not possible to distinguish it from the hardware.

3. The GASP system

When it was clear that it was not possible to find information in one place about materials that might be of use in carrying out the survey, it was obvious that the amount of work involved in the survey would be such that special software would be necessary.

Section 1.2 contains a short description of the GASP system; Section 8.4 describes how it can be used to monitor the legal status of software. It should be added here that GASP is a software assets management system. Systems of this type indicate whether the software installed in hardware is unlicensed. They also make it easier to use the minimum of software and thus contribute to savings in operations.

The materials sent out in the survey are presented in the appendices: those for Phase 1 in Appendix 1 and those for Phase 2 in Appendix 2. They contain information about GASP and how it was used in the National Audit's survey.

2.2 Execution

It was decided to carry out the survey in three phases. A short description of these follows below. As is stated above, the letters, directions, etc. sent out are included in Appendices 1 and 2 at the end of this report; the reader is referred to them for further details of how the survey was carried out.

Phase 1

Phase 1 of the survey began on 12th April 1999, when the part of the GASP system that gathers data on software was sent out. At the same time, information on the "2000 status" of computer hardware and software was collected from those parties who were covered by the survey. They were expected to submit this data to the National Audit Office.

The data-gathering part of the program was accompanied by directions on how to install and run it, and a letter to the heads of the institutions introducing and describing the survey.

As has been stated, the implementation of Phase 1 of the survey was delayed because the National Audit Office received a letter from the Data Protection Commission on 20th April stating that a complaint had been submitted concerning the survey. The National Audit Office answered this letter on 23rd April, but thereafter followed the month that the person who made the complaint was given in which to lodge further objections. The Data Protection Commission then made its ruling on the complaint on 1st June. When this ruling had been obtained it was possible to proceed with Phase 1 of the survey, including sending out a letter of reminder to those who had not let returned the materials.

1. The Data Protection Commission's ruling

The Data Protection Commission wrote a letter 1st June 1999 replying to the person who had brought a complaint about the survey. It discusses in detail the complaint, the reply given by the National Audit Office and the response by the plaintiff. Section IV of the letter presents the commission's conclusion and the reasoning behind it. This section follows in its entirety below:

“The Data Protection Commission discussed this matter at its meeting today. It has been established that the survey in question by the National Audit Office involves the gathering of data on installed computer programs that are characterised in a certain way, i.e. data on the type and version number of the software installed on each workstation or server. In the opinion of the Data Protection Commission, the project under discussion does not involve the collection of personal data in the sense of the present Data Protection Act, No. 121/1989. Even though it is clear that the meaning of the term “personal data” will undergo substantial changes if the substance of EU Directive 95/45

EC is incorporated in law in Iceland, it must be pointed out that this has not yet been formally finalised, and consequently the rules of this directive do not have a value in Iceland of the type that would make it possible to refer to them in resolving this matter.

On the other hand, it is clear that the database that will be created by the execution of this project will be traceable in certain ways back to individual persons. In the light of general considerations on the protection of the individual and personal privacy, it is natural that it should be handled with care. In the opinion of the Data Protection Commission, it is natural when projects of this type are carried out that the employees of each body should be informed with good notice about the gathering of the data and that the data-collecting part of the project should be carried out in such a way that information about the gathering of the data is displayed on the employees' computer monitors while the data are being gathered. Furthermore, the Data Protection Commission considers it desirable that measures be taken to avoid data being personally identifiable in more places than is absolutely necessary. The commission therefore proposes that the National Audit Office should not receive itemised data, but only data for each body as a whole, and furthermore that its findings should only be publicised for the state as a whole, and not for individual institutions. Taking into account the interests of employers and producers in putting a stop to the use of illegal software, however, the Data Protection Commission has no objection to the data on this point being personally identifiable by the employers (cf. paragraph 1 of Article 5 of the Act No. 121/1989) so that the situation can be brought into line with the law. The Data Protection Commission considers the procedure proposed by the National Audit Office in its letter as natural, i.e. that participants send the compressed computer files produced in Phase I of the survey to the National Audit Office in the form of a single encrypted compressed file.

The Data Protection Commission has no criticism to make of the way in which the National Audit Office proposes to

carry out its survey on the use of illegal software in state bodies.”

Phase 2

Phase 2 of the survey consisted of processing the data that was received at the end of Phase 1. This started with an examination of the “2000 compliance”, and the National Audit Office has published the results.²

Processing of data in Phase 2 ended with the preparation of a special questionnaire and other materials which were sent to the participants in the survey. The deadline for returning the completed questionnaire to the National Audit Office was 25th October 1999.

Because of a poor rate of return of the questionnaire, reminders were sent out on 3rd November to those who had returned survey materials from Phase 1 but had not yet returned the questionnaire in Phase 2.

Phase 3

In Phase 3, the questionnaires were examined in order to ensure conformity in the way participants had replied. Processing of the questionnaires began when this had been done.

When there was thought to be reason to do so, steps were taken to confirm statements that licences for particular

² 2000-hæfni vélbúnaðar og hugbúnaðar ríkisaðila. Endurskoðun upplýsingakerfa, september 1999. (The year 2000 compliance of software and hardware in state bodies. A review of information systems, September 1999.)

software was in the keeping of other parties. This was done in a variety of ways, both formally and informally.

The final stage of Phase 3 is the publication of this report. The conclusions are published in Chapter 3.

3. The Legality of Software in use in State Bodies

3.1 Number of bodies, computers and programs

Initially, the National Audit Office identified 322 bodies under Sections A, B and C of the state budget that were to be included in the survey, and sent them material for Phase 1. 17 bodies either replied jointly with others or did not have computer equipment; 278 submitted materials for Phase 1 and 27 either submitted only partial materials or failed to submit materials. In Phase 2, 242 parties, or 75.2% of the original group, submitted satisfactory replies.

In Phase 1, materials were submitted concerning software installed in 8,357 computers. The National Audit Office estimates that 2,943 computers are not covered by the survey, which therefore should have included 11,300 computers.

The findings of the survey were based on 76,347 copies of software products listed in questionnaires submitted in Phase 1. The National Audit Office estimates that an additional 20,601 copies are not covered by the survey, which therefore should have included 96,948 copies of software products.

3.2 Rate of return, by ministry

The following table shows the break-down of computers by ministry, showing a) the number of computers investigated, and for which questionnaires were answered, b) the number of computers investigated, but for which questionnaires

were not answered and c) the estimated number of computers that it is believed the survey should have covered.

	Computers examined, questionnaire answered	Computers examined, questionnaire not answered	Estimated number of computers that were not examined	Total number of computers
Highest level of government	173	0	84	257
Office of the Prime Minister	41	0	2	43
Ministry of Education	1,853	690	1,231	3,774
Ministry for Foreign Affairs	212	35	66	313
Ministry of Agriculture	176	2	65	243
Ministry of Fisheries	213	0	92	305
Ministry of Justice and Ecclesiastical Affairs	884	22	164	1,070
Ministry of Social Affairs	123	84	147	354
Ministry of Health and Social Security	1966	116	772	2,854
Ministry of Finance	651	42	97	790
Ministry of Transport and Communications	298	74	75	447
Ministry of Industry	86	0	9	95
Statistics Iceland	65	0	0	65
Ministry for the Environment	145	51	76	272
Total	7,171	1,186	2,943	11,300

Table I. Number of computers by government ministry.

3.3 Conclusions

State bodies that returned the survey materials in Phase 1 were asked about licences for the software installed. In cases where no licence was kept at the institution concerned, or elsewhere, e.g. at a computing centre or a company granting an operating lease, then they were to state whether they intended to deal with the situation by purchasing a licence, deleting the software copies or using access restrictions. There was also an option of adding

written explanations. Section 3.6 below contains a detailed discussion of the individual elements in the questionnaire and the results of the processing.

For the sake of simplicity, in the findings in this report, reference is made to software copies or numbers of programs in a broad and non-traditional sense, as this refers both to installed copies and the number of users who have access to a software product on a server. Reference is also made to the number of licences instead of the number of users for which licences have been issued. Further explanations on these points are to be found in Section 3.6.1.

1. The situation

When the answers to the questionnaires are examined, it is striking how widely the situation differs from one state body to another. It can be seen from the survey materials submitted that some of them have set high standards and adopted a policy of preventing the use of illegal software; the situation is very good in these institutions. When the survey was being made, it was evident from various indicators, including conversations and certain reactions, that others attached considerably less importance to these questions. In many cases, however, it is clear that this lack of emphasis was due more to lack of knowledge than to a lack of desire to have things in proper order.

The situation is not clear in cases where parties submitted little or no material to the National Audit, or did not answer the questionnaires it sent out. No attempt will be made here to speculate on the possible reasons for this.

2. Principal reasons

The most common reasons for the existence of illegal software detected in the survey were:

- a) Software had been installed in more computers than licences had been obtained for.

- b) Misunderstandings regarding payment for shareware.
- c) Shareware was wrongly classified as freeware.

The National Audit Office grouped the software in the survey according to type. A listing of the numbers of illegal copies of the various types of software shows that the most common types were software suites and auxiliary programs.

3. Numbers and ratios

According to the survey, there are altogether 96,948 software copies in use in state bodies. The number licences held in the state bodies is, according to the survey, 30,690, or 31.7%. There are 7,359 licences kept by other parties, accounting for 7.6% of the total. Access restrictions are applied in the case of 945 copies, or 1.0% of the total. The respondents say they intend to buy 3,724 licences (covering 3.8% of the total) and to delete 18,554 copies, or 19.1% of the total. 4,836 copies (5% of the total) are unexplained in the questionnaires that were returned. The number of copies allowed for on the questionnaires that were sent out, but for which no answers were received, was 10,239, or 10.6% of the total. It is estimated that 13,496 programs (13.9% of the total) are in use in bodies that did return the questionnaires, but are not accounted for in the survey, and 7,105 (7.3%) in bodies that submitted little or no materials in the survey.

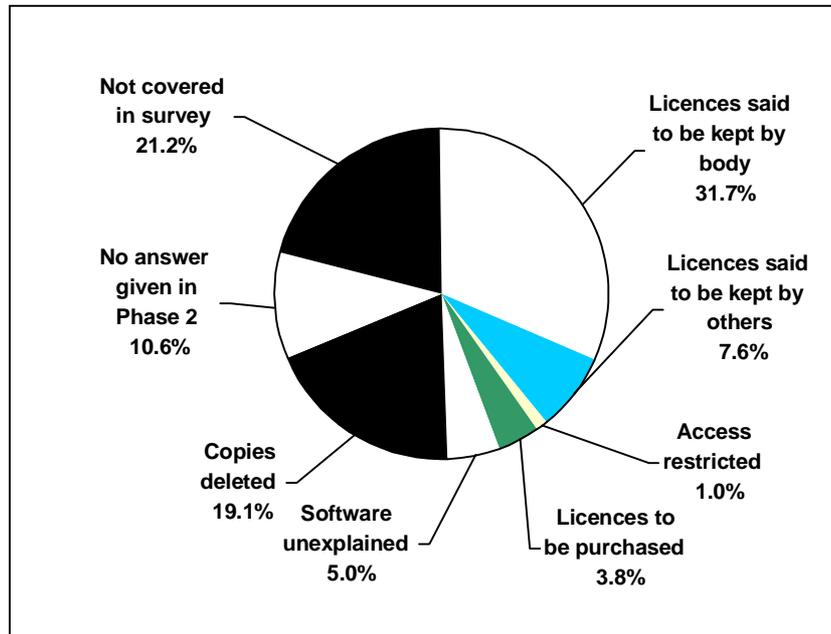


Fig. 1 Overall results of the survey of the legal status of software in use in state bodies, by answers or lack of answers.

The answers from the state bodies reveal that licences exist, or the legality of the use of the software is assured by means of access restrictions in 40.3% of the software copies covered by the survey. Software for which the respondents say they intend to purchase licences, and software for which they gave no explanation, is regarded as illegal, and comes to 8.8% of the total. The legal status of the 19.1% of the software that is to be deleted is unclear, and that of the remaining 31.8% is unknown.

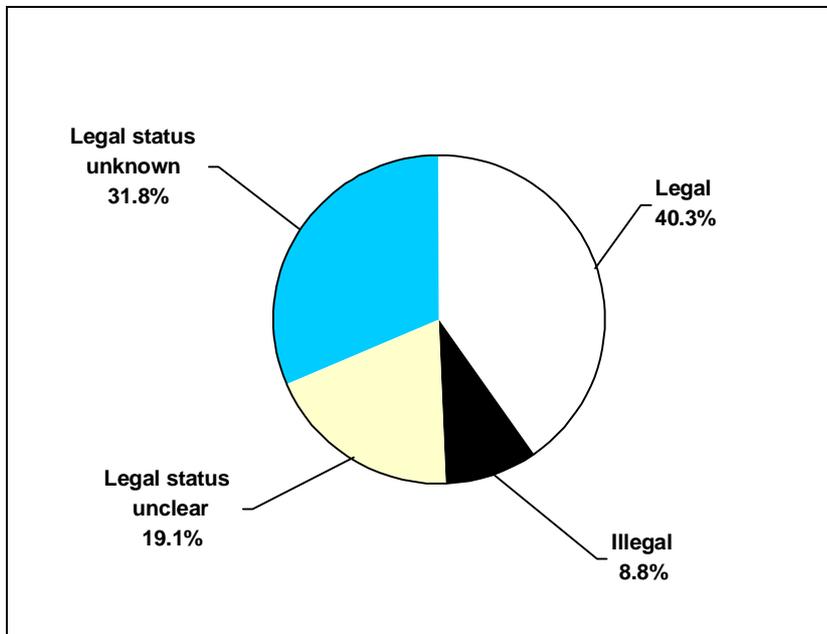


Fig. 2 Overall results, showing whether the software was legal, illegal, or whether its legal status was unclear or unknown.

Figure 3 below shows the result including only those bodies that returned survey materials from Phase 2, i.e. a breakdown of the answers given covering 66,108 software copies at 242 bodies.

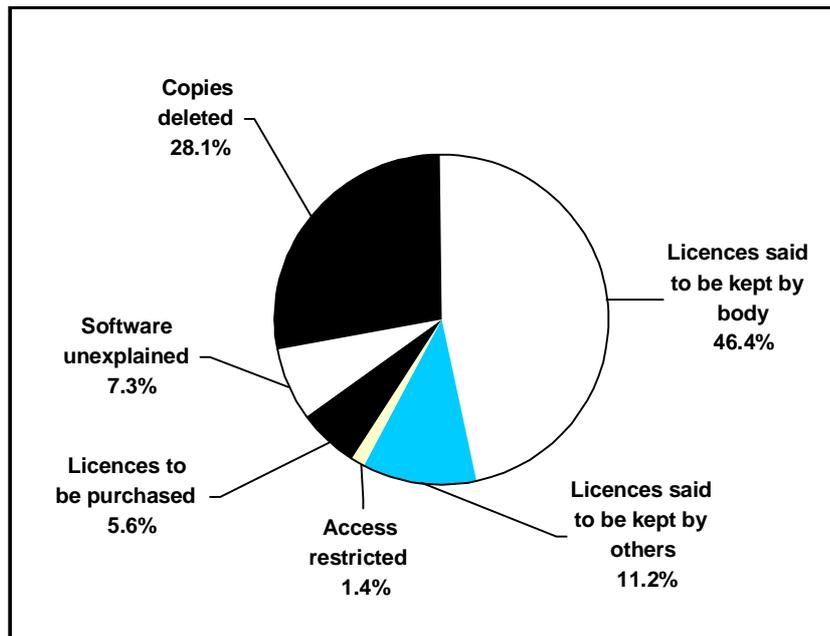


Fig. 3 Breakdown of the answers given by the 242 bodies that returned questionnaires in Phase 2 of the survey.

4. The cost of legalising software in use in state bodies

Prices of the software packages in the survey vary greatly, from a few hundred ISK (Icelandic krónur) to hundreds of thousands of ISK.

The cost of purchasing the software that the state bodies have explicitly declared that they intend to purchase is only c. ISK 60 m. The estimated value of the unexplained software is c. ISK 94 m. This is the software that can be considered illegal. The estimated value of the software that is to be deleted is ISK 294 m; its legal status is unclear. The estimated value of that part of the software the legal status of which is unknown is ISK 541 m. This consists of ISK 188 m worth of software that was listed on questionnaires that were not answered and ISK 353 m worth of software in computers for which little or no data was submitted in the survey. The basis for these calculations are presented in Section 3.5.

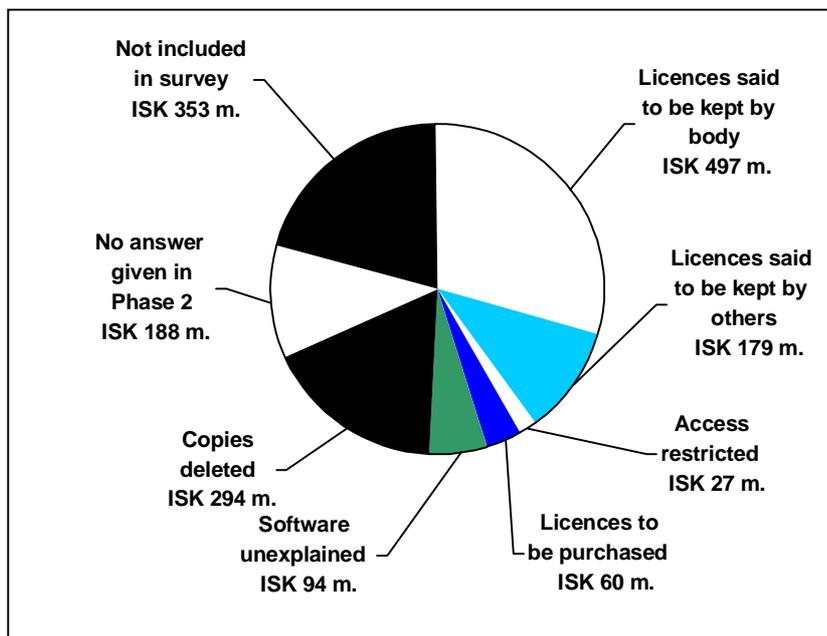


Fig. 4 Calculated price values based on the overall results presented in Fig. 1.

3.4 Estimated numbers of computers and programs not represented in the survey

1. Estimated number of computers

On the basis of various records it possesses and conversations with those in charge of the computer systems involved, the National Audit Office has estimated that no information was submitted regarding the software installed in 2,943 computers in the survey. Of these, 1,928 are believed to be in bodies which did submit data in the survey, and 1,015 in bodies which submitted little or no data. Of the 2,943 computers, 1,231 (41.8%) are in bodies under the same ministry.

2. Estimated number of programs

After deduction of the copies that are to be deleted, an average of 7 software products were installed on each of the 8,357 included in Phase 1. Extrapolating from this, it is likely that data is lacking on 20,601 copies of software products on the 2,943 computers which are not represented in the survey.

3.5 Price calculations

The calculation of prices in Section 3.3.4 is based on the following:

- 1) The quotation received by the National Audit Office in November 1999 from an Icelandic computer sales company regarding the purchase of one copy of software in its sale catalogue. The price was based on cash-payment rates available to state bodies, and not the catalogue price. No discount based on quantity was included in the quotation.
- 2) A price list dating from November 1999 from a British computer sales company which was chosen mainly because of its wide range of software and accessibility on the Internet. The price was converted at a rate of GBP 1 = ISK 116.
- 3) The price of common shareware software, obtained from the producers' Internet homepages in November 1999.

In all cases, VAT at 24.5% was added to the prices.

Prices were sought for the 76,347 copies listed on the questionnaire that was sent out in Phase 2. Prices were found for 58,528 of them in the sources listed above, and 12,461 were defined as accompanying programs appended to other programs for which prices were found, or else were free software. Thus 93% of all the software was priced. No

effort was made to establish the price of the remaining 5,358 copies of software products, or 7% of the total.

After deduction of the value of the software that was to be deleted or to which access is restricted, the estimated average price of the software installed in each of the computers examined in the survey is ISK 120,000. This average figure was used when calculating the value of the software on unanswered questionnaires and in the computers for which little or no data was submitted.

It should be pointed out that a large number of state bodies, i.e. mainly those under the Ministry of Education, have the opportunity of purchasing software on special terms. This refers to software versions that are often called “Academic Editions” (AE). It was not possible to take these special discount terms into consideration in the calculations.

For the sake of simplicity, the price of the latest version of the software was used in the calculations, even though the actual copies were older.

3.6 Individual points on the questionnaire. Processing of answers

Below follows a discussion of changes in the number of software copies, individual questions on the questionnaire that was sent out, the answers given to them and the work on co-ordination and correction to which the questionnaires were submitted before processing of the data finally began.

1. Changes in the number of software copies

Data were submitted on 116,076 copies of software products recognised by the GASP system. In the questionnaires in Phase 2, questions were asked about only 81,049 copies. There was a further reduction to 76,347

after the questionnaires were sent out; this was the final figure that emerged from the questionnaires themselves.

1. Unknown programs and files

The database in the GASP system that was used in the National Audit's survey contains data on more than 19,000 program versions. The version of the system used in processing the data in Phase 1 of the survey was issued on 8th July 1999.

When data in Phase 1 were processed, they were compared with the aforementioned database. If a software product was found in the database, the GASP system listed it as "identified"; if not, it was listed as "unidentified". In some cases, the National Audit Office changed "unidentified" listings to "identified". These emendations were marked with (p) after the name of the software product in the materials that were sent out with the questionnaires in Phase 2. The National Audit's survey covers only "identified" software.

The software (files) classified as unidentified by the GASP system consist both of actual user software not recognised by the GASP system and files which it has been decided to put into this category because they do not actually constitute user software.

When the GASP system was designed, it was not considered necessary to work with certain types of files; consequently, it was decided to classify them as "unidentified". They include various installation files (i.e. those that include setup.exe, install.exe and remove.exe in their names) and programs that begin with the symbols ~ or _, e.g. _program.exe. Files of this type are often found in temporary folders. Compressed files in .exe format, and various files in the subfolders of programming tools which frequently form part of the development work of the staff of computer departments or students' projects are also regarded as "unidentified". It is safe to assume that such files exist in very few computers.

Counts by the National Audit Office of unidentified files show that fewer than 10% of the software (files) installed on PCs in state bodies covered by the survey are listed by the GASP system as “unidentified”. If it were possible to classify all the set-up software connected with, e.g., printers, graphics cards and net cards, this figure would be even lower.

2. Grouping of copies in software suites

The GASP system counts each program in a software suite and also the software suite itself. A suite consisting of a word-processing program, a spread-sheet program, a transparency program and an e-mail program will appear in the figures in Phase 1 as four program copies, with a fifth being counted for the suite itself. When the GASP system was designed it was considered necessary to count programs in this way because it is possible both to buy individual programs and also various mixed software suites. Because of this, common software suites were grouped as single units in cases where the program that unites the suite was found on the computer under investigation. In cases like those in the above example, the questionnaire shows only one copy under the name of the suite.

3. Removal of freeware and public domain software

Before the questionnaires were prepared, attempts were made to remove from the survey as much freeware and public domain software as possible. Nevertheless, some programs were not included in this “thinning out”. It was not thought necessary to ask the public bodies about licences for software in these categories since special rules apply to it which are different from those applying to commercial software and shareware. Further reference is made to Sections 5.3 and 5.4 of this report.

4. Software installed in several copies in workstations or counted more than once on a net server

Programs frequently offer various installation possibilities, which may result in their being installed in different ways

on computers in the same network. Three possible installations are described below.

- 1) The software is only installed on the workstations.
- 2) The software is only installed on a server, and the workstations run it from there.
- 3) The software is installed either on the server or on the workstations, i.e. the installation is a mixture of the two possibilities listed above.

In addition to these possibilities, it is possible, and for various reasons not uncommon, that the same version of a program is installed twice or more often in different places on the hard disc of the workstations. In this survey, the GASP system counted both or all copies, even though it is clear that in these cases, only one copy of the software is actually used.

Section 1.4 describes how servers were investigated from a workstation. In its instructions, the National Audit Office laid down various methods designed to prevent the same piece of software on a server from being counted several times. It is clear that not all the state bodies followed these instructions, so there are some cases in which the same software set-up has been counted more than once.

It is evident that for the reasons stated above, the number of programs in the National Audit's survey was overestimated on the questionnaires that were sent to the participants. For this reason some reductions were made in the numbers, both by the state bodies themselves and also by the National Audit Office, before processing of the data submitted from the bodies involved began.

5. Number of copies installed on servers changed to number of users

It must be pointed out that changes were also made by the state bodies in the column in the questionnaire for the number of copies on a server because of the National

Audit's instructions to list under the number of copies on each server the number of users (clients) who used the software on the server. In these cases, most of the changes led to an increase in the number of users recorded in the column. It is clear that not all the state bodies followed the instructions on this point.

Due to the changes described above, a mixture of the number of software copies and the number of users, or clients, was used in the processing. In presenting the findings of the survey, it was regarded as simpler to use the term "number of copies", even though the number of users is also referred to.

6. Wrong number of installed copies used on questionnaires sent to some state bodies

An unfortunate mistake occurred when the questionnaires were being prepared as a result of which questions were based on the wrong number of installed copies at 14 state bodies the reference numbers of which in the budget began with 14, 22, 23 and 29. In all these cases, the number of copies was higher than it should have been; always at least twice as high and sometimes higher. Unfortunately, this error was discovered too late to be able to send a new questionnaire to all the bodies. In some cases it did not matter, since the supporting documents which the bodies received accompanying the questionnaires were correct, and they referred to these in order to find the correct numbers. Others made entries in the difference column due to the discrepancy. Corrections were made in the check made by the National Audit Office before the questionnaire data was processed.

2. Licences kept by the state bodies

On the questionnaires, the state bodies were to answer the question of how many users of each installed program version they had licences for in their keeping. As has been described above, the term "number of licences" has been used in the findings of this report.

Due to the scope of the report, it proved impossible to establish empirically whether the licences which the bodies reported as being in their keeping did in fact exist. Nor was it possible to establish whether or not the licences and other materials in connection with purchases were from the legal producers of the software and were therefore genuine. There is every reason for institutions to be on their guard against this possibility. It is known that imitations, i.e. illegal copies of software, have been sold in Iceland, and employees of the National Audit Office know of an instance in which a state body purchased such products due to lack of knowledge.

3. Licences kept by other parties

On the questionnaires, the state bodies were to state the number of users of each installed program for which licences existed in the keeping of other parties. The reason why this was asked is that in some state bodies, computer operations are shared with other bodies. The National Audit Office sought confirmation from those parties that were said to be in possession of the licences; this revealed that in many instances, there were either not as many licences as had been claimed for particular software, or none at all. The final figures had to be corrected accordingly.

4. Licences to be purchased

On the questionnaires, the state bodies were to state the measures they intended to take regarding illegal software copies. One possible answer was that they intended to purchase software licences. Because of the length of time the National Audit's survey took, it is clear that a large number of them had already purchased licences by the time the questionnaires were returned. Further reference is made to the section below for a discussion of the review of computer operations by various parties.

In certain cases, it was revealed that funds were not available to cover the purchases planned. It is therefore

likely that some state bodies will already have applied for extra funding this year for this purpose, and not unlikely that some of them will have had to postpone the purchases until next year.

5. Software copies to be deleted

Another answer option in connection with illegal software was that it would be deleted. When the questionnaires were processed, various reasons were found for the decision that software was to be deleted, or had already been deleted. The main ones were:

- 1) Software was installed on more computers than were covered by licences, or were needed.
- 2) A large part of the software and computer hardware used by the state bodies had been replaced since the Phase 1 data were collected, e.g. in connection with the “millennium problem”.
- 3) These were older versions of programs which were no longer being used. Often it was clear that updates to new versions had been purchased, but in some cases it was not clear whether licences had been obtained for the older versions.
- 4) Software had been installed in computers in the state bodies by the employees but without authorisation. In most cases, the legal status of the software had not been checked, as the only concern of the state body concerned was to remove the software from its computers.
- 5) The state bodies had not used, and did not intend to use, the software in their operations. This occurred mainly in cases in which the seller had supplied software of various types with new computers. In these cases, the main concern was to “clean up” and not to find out whether the software was legal or not.
- 6) The programs were evaluation versions that had not been deleted after evaluation had been made.
- 7) The same version of a program had been installed more than once in the same computer, e.g. on both the C and D drives, but only one version was in use.

- 8) The National Audit's instructions on checking servers had not been followed, with the result that the same software was counted many times. The easiest way of adjusting for such errors was to make an entry in the Delete column.

6. Access restricted

The third answer option on the questionnaire to explain a discrepancy in the numbers of users of software and licences was to specify the access restrictions applied where the number of users with access exceeded the number of licensed users. It was not uncommon for this option on the questionnaire to be chosen.

This option applies only where a program is installed on a server, in which case the version is frequently for a specific number of simultaneous users. Generally, access restrictions are built into the software itself. Where this is not the case, restrictions must be applied in the relevant network system, or special software has to be used for the purpose.

7. Unexplained software

The difference column on the questionnaire contained a formula which added together the number of copies/clients on a server and workstation and subtracted it from the registered number in the cells "licence kept by body", "licence kept by other party", "licence to be purchased", "copy to be deleted" and "access restricted". When registration was complete, the figure in the difference column for each line should be zero.

Respondents did not in all cases specify the numbers of licences or the measures they intended to take when the number of installed copies exceeded the number of licensed copies. Because of this, the questionnaires were often submitted with a difference recorded in the difference column, generally with an explanation. The National Audit Office then attempted to record the difference in the appropriate cell. Where no explanation of the difference

was offered, it was allowed to remain. It is likely that the software in these instances was illegal.

8. Checking and co-ordination of questionnaires before processing

Because the questionnaires were answered in various ways, it was necessary to check them over to ensure consistency so as to produce an overall picture of the state of affairs. Here follows a description of the procedures involved.

- 1) Some respondents did not fill in the cells on the questionnaire, instead giving all the information in the difference column or in writing in a letter. In the questionnaires from these parties, therefore, figures for all the software copies covered in the questions were in the difference column. In these instances, the National Audit Office filled in the appropriate cells.
- 2) Frequently, state bodies had licences for more copies of particular programs than were actually installed. Some of them gave an account of these additional licences in their explanatory notes, and no adjustments were made in such cases. When these additional licences were recorded in the cell for licences kept by the body or another party, resulting in a difference being created in the difference column, the number of users was adjusted to bring it into line with the number of installed copies. The main point here is that the investigation was intended to establish the legal status of installed software.
- 3) It was commonly found that people had reduced the number of registered copies in workstations because they had deleted copies. This was revealed when the number of copies referred to in the questionnaires when they were sent out was compared with the number referred to in the answers; this comparison was made in connection with all the questionnaires. Corrections were made by registering again the original number of copies and recording deleted copies in the difference column.
- 4) It was not uncommon that a licence was held for a specific software product which it was nevertheless

intended to delete. This resulted in double markings for the same copies. As legal status was the main focus in the survey, the number of licences was left unchanged, but the number recorded for deletion was removed.

- 5) Registrations concerning shareware often had to be corrected. It is clear that lack of knowledge and misunderstanding are widespread in state bodies regarding these categories of software. It was most common to find that it had been wrongly recorded as freeware, and in the same way, people seemed generally to think that shareware and freeware were free. Attention is drawn to a detailed discussion of the classification of software on the basis of copyright law in Chapter 5 of this report.
- 6) It is fairly common that software is freeware subject to certain conditions being met, failing which it is either shareware or a commercial product. There were a number of instances of corrections having to be made because the state bodies did not meet the conditions for the free use of the software, as the software was free only if used privately by individuals.

4. Copyright Legislation

Software is protected under copyright. The principal relevant legislation includes the Copyright Act and the international conventions that Iceland has ratified in this area. Here follows a discussion of some of the main features of this legislation.

4.1 The Copyright Act

Icelandic copyright legislation contained no explicit provisions on the protection of computer programs until special provisions were introduced into the Copyright Act, No. 73/1972 by the Act No. 57/1992. Before that amendment, however, it was considered that computer programs were protected under the Copyright Act providing certain conditions were met.

The Act No. 145/1996 introduced certain provisions into the Copyright Act in order to introduce the contents of various EEC directives of 1992 and 1993 into Icelandic copyright legislation. The one that is of the greatest importance in this context is the Directive 91/250/EEC of 14th May 1992 on the Protection of Computer Programs.

Article 1 of the Copyright Act states that the authors of certain works, including programs, hold the right of ownership to them, with the restrictions stated in the Act. Consequently, the user of a software program must have a licence from the copyright holder in order to use it, and if this is not the case then his use is unauthorised and also unlawful.

Article 3 of the Act states that an author has the sole right to make copies of his work.

Narrow deviations from the main rule of Article 3 are made in paragraph 1 of Article 11 *a*, which states that the owner of a copy of a computer program may make copies of the program, including spare and back-up copies, which are necessary to him in connection with the use of the program. The person concerned may not use such copies in another manner, and his right to use them ceases to apply if the owner makes his original copy available to other parties. Paragraph 2 of Article 11 *a* makes further provision concerning the right of a person who has acquired the right to use a computer program for purposes including examining, testing and investigating the program on condition that such activity is connected to use which the licensee is permitted to make of the program in connection with his use of the program. Paragraph 3 of Article 11 *a* states that the provisions of paragraphs 1 and 2 mentioned here may not be waived by agreement.

Items *a* and *b* of Article 42 of the Copyright Act now contain special provisions applying only to computer programs.

Paragraph 1 of Article 42 *a*, which was introduced into the Act in 1992, states that unless otherwise agreed, an agreement on the right to use a computer program implies the right to make such changes to the program as are necessary in connection with the agreed use, subject, however, to the provision that care must be taken not to impugn the honour of the author, etc.

The other paragraphs of Article 42 *a* were introduced into the Act in 1996. Paragraph 2 contains an authorisation to make copies and translations or back-translations of programs where this is unavoidable in order to obtain data necessary to achieve operational compatibility between an independent program and other programs, providing certain conditions, which are given in the article, are met.

Paragraph 3 states that data obtained under paragraph 2 may only be used in order to facilitate operational compatibility with other programs, and not in any way that could interfere with the legal interests of the original copyright holder regarding normal exploitation of the program or violate his copyright in any other way. Paragraph 4 states that the provisions of paragraphs 1 and 2 may not be waived by agreement.

Article 42 *b*, which was introduced into the Act in 1992, states that if the creation of computer programs is part of the conditions of employment, then the employer shall acquire copyright in the programs unless copyright is reserved in some other way.

Article 54 of the Copyright Act states that violations of the Act are punished only if they are committed on purpose or through gross negligence. Actions that violate authors' copyright under Article 3 are punishable by fines or imprisonment of up to two years.

Article 56 of the Act states, i.a., that when a criminal violation of the Act results in financial loss, compensation is to be made according to the general principles of Tort Law and the author is to be awarded compensation for non-pecuniary loss from the party who, through his illegal action, has interfered with the author's rights.

4.2 Membership of international conventions

The explanatory notes to the bill which became the Act No. 57/1992 stated that there was serious discontent among Icelandic copyright organisations regarding the delay in Iceland's ratification of international copyright conventions. Furthermore, the World Intellectual Property Organisation (WIPO) had declared its concern over the situation and recommended that it be rectified as soon as possible. At the time, Iceland was a member of two international copyright conventions.

The first of the conventions of which Iceland was a member at the time that the aforementioned bill was drawn up in 1991 was the Berne Convention for the Protection of Literary and Artistic Works of 1886 as revised and approved in Rome on 2nd June 1928. Great changes have been made to this convention since Iceland became a member. The text of the convention was amended in Brussels in 1948, in Stockholm in 1967 and in Paris in 1971. By the Act No. 80/1972, the Althing was authorised to ratify the Berne Convention in the form in which it was approved by the Paris Act of 1971. However, Iceland only became a member of the Paris Act of the convention on 25th August 1999; at the time of writing, no advertisement to this effect has yet appeared in Division C of the Law and Ministerial Gazette.

The second convention of which Iceland was a member at the time of the bill which became the Act No. 57/1992 is the international convention on copyright known as the Geneva Convention, of 6th September 1972. The text of the Geneva Convention was amended in Paris in 1971; Iceland has not yet become a member of the convention in the amended form.

In order to open the way for Iceland to become a member of international copyright conventions, it was proposed in the bill which became the Act No. 57/1992 that a general provision be introduced into the Copyright Act authorising the executive to ratify such conventions without special legislation being required on each occasion, though on condition that reciprocity apply. This provision is now Article 61 of the Copyright Act, and runs as follows:

“The scope of the Act may be broadened to include foreign nationals providing the conditions regarding reciprocity are met. For this purpose, the Government is authorised to ratify international conventions on reciprocal protection without provisos or with such provisos as the Government considers appropriate and may be made. For the purpose of this Article,

“reciprocity” means that copyright holders in each member state shall enjoy the same rights in other member states as nationals of those states. The provisions of this Article shall in no way interfere with the validity of international conventions in the field of copyright that have already been ratified by Iceland.”

The Rome Convention of 1961, which applies to performing artists, and not to copyright in the conventional sense, was ratified by Iceland on 15th March 1994, and took effect in Iceland on 15th June that year. An advertisement on the entry into force of the convention in Iceland, together with the full text of the convention, appeared in Division C of the Law and Ministerial Gazette that year.

The parliamentary resolution No. 269 of 30th December 1994 authorised the Government to ratify the treaty establishing the General Agreement on Tariffs and Trade (GATT), which took effect on 1st January 1995. The agreement is accompanied by various appendices which are regarded as forming part of it, including Appendix 1C, on Trade-Related Aspects of Intellectual Property Rights (often referred to as the TRIPS Agreement).

4.3 New legislation from the European Union

1. Protection of databases

On 11th March 1996, the European union approved its Directive 96/9 on the protection of databases. Icelandic legislation has not yet been harmonised in line with this directive.

When amendments that were made to the Copyright Act in 1992 were being prepared, there was some discussion of whether provisions should be introduced regarding databases. The committee considered it right that provisions on databases should for the most part be deferred until a general revision of the Copyright Act took place. The notes to the bill go on with the following comment on this point:

“As regards databases, it is not recommended at present that special provisions be enacted regarding their activities, as it is considered that the input of protected works into such databases and their distribution from there to the public are subject to protection under the general provisions of the Copyright Act on the making of copies. However, the Minister is authorised to set rules on the making of machine-readable copies for use in such databases when this is considered necessary.”

2. Copyright in a digital environment

A draft directive from the European Commission on copyright in a digital environment has been under discussion in institutions in the EU member states for a long time. The draft has been highly controversial, and it is not clear when the directive will take effect.

5. Classification of Software on the Basis of Copyright

Software producers who are also the copyright holders generally do not assign their copyright when the software is sold. What they sell is an authorisation to use the software in accordance with conditions stated in the software licence that is handed over when the sale takes place. The software licence is proof that the person concerned has a legal right to use the relevant software.

When software is bought “off the shelf”, i.e. in the form of software packages, which are generally of foreign origin and mass-produced, the licensing process is simple. In such cases, the purchaser is obliged to accept the conditions for use that are set forth in standardised software licences. These licences either take the form of a special document or are included in the accompanying manual. In the case of custom-designed software, the licensing process is more complex.

Software may be divided into four main categories on the basis of copyright-related considerations, i.e. commercial software, shareware, freeware and public domain software.³

³ This classification is borrowed from EDUCASE, an organisation that campaigns for the use of information technology in higher education in the USA. The classification is used by SPA Anti-Piracy, which runs publicity and takes action in connection with infringements of copyright held by members of the Software and Information Industry Association (SIIA). The Software Publishers' Association (SPA) in the USA now operates within the SIIA. See www.siiia.net/piracy.

5.1 Commercial software

The largest software category is commercial software, which accounts for the majority of the software purchased from software producers, computer sales firms, etc.

This category includes most of the types of software licence discussed in Chapter 6 of this report. The main copyright features are as follows.

- 1) The software is protected by copyright.
- 2) While a back-up copy of the software may be made, it may only be used if the original software becomes damaged or destroyed for some reason.
- 3) Changes to the software other than those permitted under paragraph 1 of Article 42 *a* are prohibited.
- 4) Reverse engineering, decompilation or disassembly of a final program in order to reveal its source code is not allowed without the permission of the copyright holder (*cf.*, however, the strict terms of exemption from this general rule in distinctly defined cases in Article 42 *a* of the Copyright Act). The exemption also covers translations and copies.
- 5) The development of new software based on software in this category, i.e. the production of derived software, is not allowed without the permission of the copyright holder.

5.2 Shareware

Shareware is a distinct category of software. Shareware may be tried out. If after a trial one decides to use it, it is then necessary to pay for the software.

The following are the main copyright features of this category:

- 1) The software is protected by copyright.
- 2) While a back-up copy of the software may be made, it may only be used if the original software becomes damaged or destroyed for some reason.

- 3) Changes to the software other than those permitted under paragraph 1 of Article 42 *a* are prohibited.
- 4) Reverse engineering, decompilation or disassembly of a final program in order to reveal its source code is not allowed without the permission of the copyright holder (*cf.*, however, the strict terms of exemption from this general rule in distinctly defined cases in Article 42 *a* of the Copyright Act). The exemption also covers translations and copies.
- 5) The development of new software based on software in this category, i.e. the production of derived software, is not allowed without the permission of the copyright holder.

Shareware is a variant of commercial software, which is discussed in the foregoing section. The decision to sell certain programs as shareware is a marketing decision which does not affect the legal conditions applying to copyright. They are therefore exactly the same as those applying to commercial software (*cf.* Section 5.1).

The authors of shareware market it electronically on the Internet, with direct-line services, etc.⁴

The authors of shareware state various restrictions in their software licences. Most of those who serve their software demand the payment of a registration fee, which is in fact the purchase price, if the user continues to use the software after the end of the trial period. Software of this type generally contains an opening menu or a special text file stating clearly that the program is shareware and specifying how to pay for a licence to use it.

Most of the authors of shareware specify the length of the trial period and demand payment when it is finished. Others do not specify the length of the trial period and trust users to judge when their trial is complete. Some authors demand

⁴ This and the following information about shareware has been obtained from the Association of Shareware Professionals (ASP). See www.siiia.net/piracy.

that users register, but they do not demand any registration fee. In such a case, this free shareware is known as “\$0 shareware”.

5.3 Freeware

In some cases, software producers grant a free right to use their software. The use of such “freeware” may nevertheless depend on certain conditions. Copyright in connection with software of this type is very different from that applying to ordinary software. The following are its main features:

- 1) The software is protected by copyright.
- 2) Copies of the software may be made, either as back-up copies or for distribution, but such distribution may not be for profit.
- 3) Changes may be made to the software.
- 4) Reverse engineering, decompilation or disassembly of a final program in order to reveal its source code is allowed without the permission of the copyright holder.
- 5) The development of new software based on freeware, i.e. the production of derived software, is permitted and is encouraged, subject, however to the condition that the derived work must also be characterised as freeware. This means it is not permitted to take a piece of freeware, make changes or additions and then sell it as commercial software or shareware.

It is common that freeware for individual private use changes into shareware when it is used in the course of business operations. In such cases, the main points regarding copyright are in accordance with that category.

5.4 Public domain software

The fourth and last category of software in this discussion is public domain software. The main copyright features are as follows:

- 1) Copyright in the software is waived.

- 2) Copies, both as back-up copies or for distribution, may be made, and no restrictions are imposed regarding the distribution.
- 3) Changes may be made to the software.
- 4) Reverse engineering, decompilation or disassembly of a final program in order to reveal its source code is allowed.
- 5) The development of new software based on software in this category, i.e. the production of derived software, is permitted without restrictions regarding either the distribution or the use of the derived software.

6. Types of Licences and Software Updates

Conditions for the use of software may vary from one software producer to another, in addition to which the same produce may impose different conditions according to the nature of the program. Many different types of software licence may be distinguished. This variety makes for a great increase in the work associated with using only legal software.

Below follows a description of various types of software licence, i.e. the various types of condition specified in contracts between the copyright holders and the purchasers of software licences. Updates of software are also discussed.

6.1 Individual licences

The most common type of software licence for personal computers is subject to the condition that a separate licence be purchased for each computer or each user.

1. Licences for each computer

A separate licences must be purchased for each computer in which it is intended to use the software, e.g. 50 licences must be purchased for 50 computers.

It happens that bodies/companies purchase licences of this type for all the computers they own even though the software is not needed in all the computers. This is done in order to be absolutely certain that there is no infringement of copyright.

2. Licences for particular individuals

Under a software licence, the right to use the software may be attached to a particular individual or individuals. This type of licensing is the most suitable when the software is used by only one person or a few people. In cases of this type, it is completely clear who may use the software, but questions may arise concerning other matters, e.g. whether the individual is permitted to use it both in his work and outside his work.

A licence for particular individual normally means that he is only permitted to use the software in one computer. Installation of the software on another computer, even if it is owned or used by the individual concerned, may constitute an infringement of copyright. Some producers permit the user to make additional copies. In such cases, it may be permissible to make copies both for a computer used at work and also for a home computer and/or a lap-top. The reasoning behind this is that the individual concerned can not be in more than one place at the same time.

The type of licensing described above is not appropriate in places where frequent changes of personnel take place, and consequently it is not common.

Infringements of individual software licences

Where an individual software licence has been granted, the software may not be loaned. This would constitute a violation of copyright.

Installation of the same program copy on many personal computers without purchasing a licence for each would constitute a violation of the copyright applying to individual licences.

If software is installed on a server so that many users can use it, this constitutes a violation of the copyright applying to individual licences.

6.2 Simultaneous licences

Simultaneous licences permit only a specific number of users to use specific software at the same time. The number of users may be limited to 5, 10, 25 or more, depending on the producer.

In a body with a staff of 25, where it is likely that never more than 10 people will have to use the same software simultaneously, it would only be necessary to purchase a simultaneous licence for 10 users. In such cases, the number of users permitted is generally registered in the software in advance, and the software itself monitors the number and does not permit access to more at the same time. However, this is not always the case. If the producer does not build such an automatic monitoring facility into his software, then it is the responsibility of the purchaser in each individual case to ensure that it is used legally.

Software with built-in monitoring of the number of simultaneous users is often sold in special package versions for net servers. In such cases, there is generally a licence in the package for a specific number of users, e.g. 5. Frequently, therefore, it is necessary to purchase licences for a larger number of users than is necessary, e.g. if the number of users is actually 8, then it may be necessary to purchase licences for 10 users, etc.

Infringements of simultaneous licences

If more people use a software program simultaneously than are permitted under a simultaneous licence, this constitutes an infringement of copyright. If, for example, a company installs software with a licence for 5 simultaneous users on a network, and 25 people use it at the same time, then 20 people are breaking the terms of the software licence.

6.3 Site licences/company licences

“Site” may have various meanings in the expression “site licences” relating to the use of software. They include:

- A particular geographical location, e.g. the branch of company A in Reykjavík.
- One company in several locations, e.g. the branches of company A in Ísafjörður, Akureyri and Reykjavík.
- A particular department on two floors of a particular building, e.g. the service department of company A.
- The offices of the company A, including all its employees’ personal computers in their homes.

A site licence either covers an accurately defined number of software copies or else it is granted in a single copy which can be used for an unlimited number of computers.

A company licence is valid for unlimited use of a specific software program, though subject to certain conditions. These usually involve the annual renewal of the licence. This type of software licence is intended for large-scale users with a large number of computers in many locations.

Infringements of site licences

Copyright is infringed if software covered by a site licence is installed in more “sites” than are permitted in the licence. Copyright is also infringed if users copy the software for use on their own home computers, even if they are working on them in connection with their jobs, if this is not permitted by the licence.

6.4 Network licences

The producers and the users of software may have totally different definitions of a network. For this reason, the terms of network licences must be read extremely carefully in order to be sure of the conditions imposed by a producer for the use of the software.

Net licences are generally restricted to local area networks or individual servers. Network licences differ from simultaneous licences in that all those who have access to the network may use the software for which the network licence is granted. The number of users is limited only by the number of connections that the network operating system permits for the server.

It is not normally permitted under network licences to install a software program on more than one net server, and software is often encoded in such a way as to make this impossible.

Network licences have the advantage that it is not necessary to count the number of users or computers exactly. As all that is involved is the installation of one copy of the software, monitoring of licences, upgrades, etc., is simple.

Infringements of network licences

Copyright is infringed if the software is installed on more than one server at the same time.

6.5 Software suites

The term “software suite” is used to refer to the sale of a group of user programs together, generally under a single name. Only one software licence applies to each suite. Microsoft Office is an example of a widely-used software suite, consisting of Word, Excel, PowerPoint and Outlook;

the licence is granted for Office. All the programs in the suite are to be installed in the same computer.

Infringements of software suite licences

Copyright is infringed if programs A and B from a particular suite are installed in different computers.

6.6 Bundled software

The term “bundled software” is used to refer to the sale of computer hardware and software together as an entity. This applies, for example, to cases where an operating system accompanies the hardware with an OEM (Original Equipment Manufacturer) licence.

When an upgrade of bundled software is purchased, the new version becomes a part of the relevant software. Each upgrade must be installed on the computer that the software was originally supplied with. Both versions are then under the same software licence (see further below in the section on upgrades.)

Infringements of bundled software licences

Under no circumstances may upgrade versions of bundled software be installed in another computer, since this constitutes an infringement of copyright.

6.7 Customised software

It happens that the mass-produced software available on the general market does not meet a particular user’s requirements, so he has software specially produced for him. In such cases, the question arises: Who is the copyright holder: the purchaser, who in many instances has submitted descriptions of the working procedure and basic guidelines for the design of the system, or the person who

undertook to actually write the software. Questions may also arise regarding the permissible use of the software.

When customised software, or a combination of customised and standard software, is purchased, agreements must be made regarding the right of ownership, on the one hand, and the right of use on the other. As has been stated above, the rights of the authors of computer programs are protected under the Copyright Act, No. 73/1972. The general rule under Article 1 of the Act is that the author of a computer program has the right of ownership, and the Act provides merely for the right of use by the purchaser unless other terms are agreed (*cf.*, however, the exceptions mentioned above in connection with computer programs as provided for in Articles 42 *a* and *b* of the Copyright Act).

Section 11.6 of the purchasing manual on information technology which was compiled by the Advisory Committee on Information and Computer Technology (the RUT Committee) and published by the Ministry of Finance in 1998 states that in each individual instance, the purchaser must assess how broad a right of use he requires and, at the same time, whether he considers it necessary to make an agreement on terms other than the general rule regarding copyright. The terms regarding both these points must be stated unequivocally in the invitation to tender, job specifications or job contract. Appendix 3 in the manual contains sample texts which can be used in agreements between state bodies and contractors in connection with the production of software.

A distinction can be made between two types of customised software: one in which the contractor provides the purchaser with the source codes of the software and the other in which the contractor provides the purchaser with the executable code only. If part of the software is delivered only in the form of executable code, then the RUT Committee recommends that the purchaser and contractor agree that the source code, together with related documents, be lodged with a third party and be released to the purchaser only under specific circumstances, e.g. in the event of the insolvency of the contractor.

6.8 Software upgrades

An upgrade consists of an improved or adjusted version of the original version of a piece of software. The software producer may have added supplementary functions to the program or made substantial improvements to it. When a software producer who has offered Version 5.0 of a particular program for sale then markets Version 6.0, the latter is an update of the former. In this case it is sometimes referred to as a major upgrade, while if a Version 5.1 is produced, it is more generally referred to as a minor upgrade.

A person who holds a licence for Version 5.0 of a particular program must decide which of the following steps he intends to use to take if he wants to upgrade his software to Version 6.0:

- a) If he uses Version 5.0 and decides to purchase an upgrade to Version 6.0, he will have only one licence for both versions, because the upgrade constitutes an adjustment of the original version. The upgrade does not confer a new licence, and may only be carried out on the hardware that was covered by the licence for Version 5.0. If that licence was for only one computer, then the software may only be updated in that computer. A software update from one version to another costs less than an ordinary software purchase.

In order to purchase an update, the purchaser must demonstrate that he holds a licence for Version 5.0. The older version of the software becomes a back-up copy and may not be given or resold.

- b) If he uses Version 5.0 and decides to purchase Version 6.0 at full price instead of purchasing an update from one version to the other, he may sell the older version if this is permitted in terms of the software licence, or give it away.

In this case, the person concerned would have to pay the full price for Version 6.0 and would not have to

demonstrate that he held a licence for Version 5.0. When this course of action is chosen, the person concerned ends up with two licences, one for Version 5.0 and one for Version 6.0.

It is extremely important to maintain an accurate register both of upgrades and of purchases of new software. It may also prove convenient, if the course of action described in a) above is chosen, to market discs, manuals and documents connected with the upgrade with the letter U.

When purchasing software upgrades, purchasers must produce software licences to demonstrate that they own a legal copy of the older version. It should be mentioned here that upgrade versions are very frequently designed to allow for the existence of an older version of the software. If an older version does not exist, then the upgrade is useless, i.e. it can not be used on its own.

Many software producers use “competitive upgrades” to win a market share for a particular piece of software. A competitive upgrade is nothing but a special offer from the producer to the purchaser. If, for example, a purchaser uses a spreadsheet program from producer A, but producer B is eager to have him use his spreadsheet program, then it is possible that producer B will offer the purchaser the spreadsheet program at a substantial discount.

As a competitive upgrade is a special sales offer, accepting the offer does not entail an obligation on the part of the purchaser to stop using the program he originally bought, i.e. the spreadsheet program from producer A in the example above: producer B is not able to invalidate the licence applying to it. In this example, therefore, the purchaser would hold two valid software licences.

7. Infringements of Copyright

Infringements of software copyright are often referred to under the general term “software piracy”, and involve the illegal use of the software. The SIIA (Software and Information Industry Association) lists six types of infringement, short descriptions of which follow below:

7.1 Programs used on more computers than are covered by the licence (“softlifting”)

This type of infringement, known as “softlifting”, comes about when a software program is purchased with an individual licence, i.e. a licence for a single user, and is then installed on several computers in violation of the terms of the licence. This type of infringement also covers cases in which users pass software programs on to their friends, colleagues, etc.

7.2 Internet piracy

This type of infringement consists of obtaining copyright-protected software over the Internet without the owner’s permission, or furnishing other users with serial numbers or other special implements in order to enable them to by-pass special barriers that are set up to defend software copyrights.

7.3 Counterfeiting

This type of infringement consists of making, distributing and/or selling software that appears to come from the

original producer. Counterfeiting can be highly convincing. For example, a great deal of care may be taken to ensure that packaging and the materials contained therein look original. This is not always the case, however: labels may be hand-written and discs may be wrapped in very ordinary plastic covers, etc.

7.4 Hard-disc loading

This type of infringement is committed when computer sellers load copies of non-original software onto the hard discs of PCs that are offered for sale. For example, a computer seller in Reykjavík was sentenced for an offence of this type in the Reykjavík District Court on 6th October 1999.

7.5 Rental piracy

This type of infringement consists of renting software out without the permission of the copyright holder. Furthermore, it is common in cases of this type that those who hire the software copy it onto the hard discs of their computers and then return the rented copy to the renter. Three sub-categories of this type of infringement are defined as follows:

- 1) A retailer rents out software for use in the home or work computer of the hirer.
- 2) The software is rented out through “order clubs”.
- 3) The software is installed in computers that are temporarily rented out.

Copyright holders sometimes authorise the installation of software on computers that specific firms rent out on a temporary basis, or supply under leasing contracts. In these cases, the condition is set that in the rental or leasing contracts between the lessor and the lessee, the latter

accepts the conditions of use that are stated in the licence accompanying the software.

7.6 “Unbundling”

This type of infringement consists of transferring bundled software from the computer for which it is licensed to another computer, and also of selling bundled software on its own.

8. Purchase and Use of Legal Software Only

It is important to raise awareness of, and respect for, the rights of the authors of computer software, and so to encourage the purchase and use of legal software.

It must be made clear to all that a software licence is an agreement between the copyright holder and the purchaser, containing provisions on the legal use of the software by the purchaser. It is also necessary to make it completely clear what documents are normally supplied when legal software is purchased. Everyone in charge of purchasing software and operating information systems in state bodies must therefore be familiar with these matters. It is also important that other employees who use the information systems be made aware of them.

The preceding chapters have discussed software copyright, the main types of copyright infringement, the categorisation of software according to the main rules applying to its use, some types of software licences and the rules on software updates. Below follows a discussion of the need to make employees aware of these matters. Then follows a description of the documents that should be provided on purchase and a discussion of the necessity of maintaining a constant survey of the legality of the software in one's own computer system.

8.1 Documents to be supplied on purchase

To ensure that only legal software is purchased, the purchaser must realise what documents he should receive when he purchases the right to use software. The following

discussion applies mainly to software that is classified as commercial software and shareware.

1. Software licence

A software licence is an agreement between the copyrightholder and the purchaser stating the terms to which he agrees regarding the use of the software. When he purchases software, the purchaser should always receive a special software licence; licences are also issued regarding both shareware and public domain software. A licence is the most important item for proving that the user has a legal right to use the relevant software.

A software licence either consists of a separate document included in the packaging of the software, or else is to be found inside the manual accompanying the equipment. If software is purchased or received mechanically, it should be accompanied by a licence that is to be printed out for safekeeping. The term "licence" may occur in combination with various other words, e.g. "Software Licence," "Software Product Licence" or "End-User Licence Agreement" (EULA).

When purchasing software upgrades it is necessary to demonstrate ownership of a licence for the older version by producing the licence. Production of a receipted invoice for the purchase is not sufficient.

2. Software on a medium

The purchaser of a licence to use software should always receive an original medium, i.e. a CD, floppy disc, or similar item. The fact that the seller has installed the software in the purchaser's computer hardware has no effect on this. This does not apply if software is purchased over the Internet.

3. Manuals

Manuals accompany most software packages. These either consist of printed books or are included on an accompanying CD or floppy disc. If the software is

purchased over the Internet, it should be possible to download a manual.

When printed manuals are supplied with software, they should be delivered in original copies, not photocopies. Where software licences are inside the manuals and the users receive only a photocopy, and not an original, it may prove difficult for the purchasers to prove that they have legal copies of the software.

4. Certificates of authenticity

Some producers issue special certificates of authenticity with their software, the aim of this being to prove that the software is genuine. Such certificates may be on the side of the packaging in which the software is supplied, on the front of the manual or on the outside of the package with the licence.

Particular care must be taken not to confuse a certificate of authenticity (or “certificate of authority”), abbreviated COA, with a software licence. A COA label or document does not constitute a software licence and can never take the place of one, since a COA never states the terms of use that accompany the software to which they refer.

8.2 Indications that illegal software is being sold

The following points, taken from the publicity material of the SIIA, give an indication that illegal software is being sold:

- The software is sold in a clear CD box, and is not accompanied by a software licence, manual, registration card or certificate of authenticity/authority.
- The software is marked “Academic Product” or “Academic Edition” (AE).
- The software is marked “OEM” or “For Distribution Only With New PC Hardware”.
- The software CD has a hand-written label.

- The software copy discs supplied by the seller have hand-written labels.
- The documents or manuals supplied with the software have poor-quality graphics or colour printing.
- The same CD contains a number of different programs from different suppliers.
- If, when the software seller has installed the software in a computer and the purchaser asks for a manual, he says the best thing to do is to buy a beginner's guide from a bookshop.
- If photocopies of the manual are supplied.

8.3 Employee awareness

Copyright infringements are probably more often committed through negligence due to lack of knowledge and failure to act rather than on purpose.

Employee education is an important element in the campaign to have state institutions and bodies use only legal software. Employees must be made to realise the limitations imposed by the authorisation to use the software and the importance of not infringing them, and also of the possible consequences if they fail to observe the limitations.

In this connection, attention must be given not only to the software that is installed and used by the body involved: it must also be remembered that employees frequently install software that they have purchased or obtained by other means, e.g. by downloading it from the Internet. Employees frequently do this without the knowledge or permission of their employer, and the legal status of such software may vary widely.

Installation by employees of their "own" software in their employers' computer hardware frequently constitutes an infringement of copyright, and may result in loss and inconvenience for an employer who believes that he only

uses legal software. Furthermore, installation of software also entails an increased risk of computer virus attacks in the employer's computer system.

8.4 Monitoring of the legal status of software

Here follow some broad guidelines on how to ensure that installed software is legal. State bodies can make this work easier by using the GASP system, which will be supplied to them when the survey is complete, and was specially designed to monitor the legal status of software. Obviously, however, it is only suitable for use on PCs and therefore does not cover larger computers.

1. Computer hardware registers

Each state body must at all times maintain a register covering the computers it owns, i.e. showing the number of computers owned by the institution or company. It must cover PCs, Macintoshes, servers and lap-tops, irrespective of whether individual items are in use or not.

The hardware register must at least contain details of the serial number, type and location of each computer. Sometimes the person who uses each computer is also listed.

State bodies can use the GASP system to maintain a register of their computers. All fields in the system's registration form for hardware, with the exception of the computer number, can be defined by the user. In the following picture, the fields likely to be used by state bodies have been defined. The fields can be defined so that it is possible to choose options from a pull-down menu, so defining use in a workstation, net server, lap-top, etc.

Computer Information	
Auðkenni tölvu	Fjárlaganr./Staðsetning
RE1023	00-000 0101
Notkun vélar	Vélarategund
Utstod	IBM PC
Kaupár	Raðnúmer
1999	12345-DFG-6789
Eignarskránnúmer	User-defined Field 7
123	
User-defined Field 8	User-defined Field 9
User-defined Field 10	User-defined Field 11

Waiting for user input

Fig. 5 Example of hardware registration in the GASP system

The hardware register must be updated each time a change is made.

2. Register of software

In order to monitor the legality of installed software, it is necessary to make regular checks of the software installed in the computers listed in the equipment register. Software licences must then exist for the software to be considered legal.

A particular part of the GASP system was used in Phase 1 of the National Audit's survey. It can be expected that the state bodies will already have taken the necessary measures to ensure that their systems contain only legal software. In order to make it easier to continue with monitoring, the best procedure is to enter in the GASP system data on the software that is currently installed. The screen display below is used for registration of this type. The data that must be entered includes whether the software is for a PC or a Macintosh, the name of the producer, the name and version number of the software, the type of licence, the number of copies and whether or not the software is in use. The other fields in the display are for optional extra data, such as the name of the person who makes the entry, the version from which an upgrade was made (if applicable), the name of the seller, the date of installation and, if the

licence is temporary, when it is due to expire. Finally, notes and the serial number of the software can be recorded.

The screenshot shows a 'New License Information' dialog box. It is divided into two main sections: 'Application' and 'License Information'.
In the 'Application' section, there are two radio buttons for 'System Type': 'PC' (selected) and 'Macintosh'. To the right, there are two dropdown menus: 'Publisher' (set to 'R:Base Technologies') and 'Application and Version' (set to 'R:Base 3.1').
The 'License Information' section contains several fields: 'License Type' (dropdown, 'Machine'), 'Count' (spinner, '10'), an 'Active' checkbox (checked), 'Entered By' (text field, 'Gunnar'), 'Upgraded From' (dropdown, empty), 'Vendor' (text field, 'Hugbúnaðarsalan ehf'), 'Effective Date' (text field, '6.6.1999'), 'Expiration Date' (text field, empty), and 'Reference' (text field, 'fskj. 123 / 1999').
At the bottom, there is a 'Notes / Serial Numbers' text area containing the text 'Raðnúmer ABC123456DEF'. 'OK' and 'Cancel' buttons are located at the bottom right of the dialog.

Fig. 6 Example of software registration in the GASP system

The software register must be updated each time a change is made.

3. Regular running of the GASP system

Once software has been registered in the GASP system, the system can be run regularly to check on installed software. When it is run, the system compares details of the registered software with the installed software and generates a list of software that is installed but not registered. This list must be examined carefully and suitable action taken.

Using the above procedure, state bodies can make an important contribution towards ensuring that the software they use is legal at all times.

Appendix 1 - Materials Distributed in Phase 1 of the Survey

Here follows the text of the letter that was sent to all participants in the National Audit's survey of the use of illegal software stating how the GASP system was to be used to gather data, and also the text of the letter of reminder sent to those who had not submitted data from Phase 1 by 2nd June 1999.

<Name of institution> 12th April 1999 M-369
<Address> SP/bb
<Postcode> <Town>

On 20th January this year, the Minister of Education signed an agreement on behalf of the Government of Iceland with the US software company Microsoft. Under this agreement Microsoft will translate the Windows 98 operating system into Icelandic, in exchange for which the Government undertook to put an end to the use of illegal software by state bodies and institutions, and other bodies whose operations are funded by the state, by the end of 1999. After the agreement was signed, the Minister asked the National Audit Office to make a survey of the use of illegal software by these bodies. At the same time, the Advisory Committee on Information and Computer Technology (the RUT Committee), which works for the Office of the Prime Minister and the Ministry of Finance, was commissioned with mounting a campaign to eradicate such software from the bodies covered by the survey.

The National Audit Office's survey will cover bodies in Sections A, B and C of the state budget, of which there are about 300. It is thus a very extensive survey. Obviously, it will unavoidably necessitate a certain amount of work on the part of the bodies involved. The National Audit Office has, however, made efforts to minimise this, partly by purchasing the GASP system from the US company Attest Systems Inc., for which Tæknival Ltd. is the Icelandic service agent.

A specific part of this software system will be used in the National Audit's survey in order to establish what software is installed in the computer equipment in the aforementioned bodies. The system as a whole will also be of use to them in the management of software in the future, as it can be used to maintain a register of the software licences held by each body. In addition, the GASP system may be of use in dealing with difficulties arising in computer systems due to the change to the year 2000, as it can establish whether the personal computers used are equipped to deal with the change and whether they are programmed to treat the year 2000 as a leap year. These

points will also be dealt with in the aforementioned survey. The GASP system can also identify the software that is likely to cause problems if it has to deal with the year 2000 in dates. The system does not, however, provide the ultimate solution to the Year 2000 problem.

Under the aforementioned agreement between the Minister of Education and Microsoft, a survey of the use of illegal software in the bodies covered by the agreement is to be completed in May. Please find enclosed that part of the GASP system which gathers data mechanically on the software installed in your computer equipment and also on certain matters connected with the Year 2000 problem, together with instructions on how to install and run it. After using it, the data collected by the software must be returned to the National Audit Office by 23rd April at the latest for processing. The findings, in the form of a list, will be sent to you again together with a questionnaire concerning software assets. After answering the questionnaire, it is possible that your institution will be required to submit further data.

The National Audit's survey will end with the publication of a report containing the overall findings regarding the use of illegal software. The report is intended as an aid in the work of the RUT Committee directed towards putting these matters in order. In addition, the National Audit Office will prepare a separate report, based on the same data, on the situation with regard to the Year 2000 problem.

After the survey is completed, the full GASP system will be sent to all participants so that they can make use of all its features.

Enclosed:

Diskettes containing the data-collection part of the GASP system, together with instructions.

12.4.1999

Instructions on the gathering of data on software in connection with the National Audit's survey of the use of illegal software in state bodies under Sections A, B and C of the National Budget.

Contents

1. General
 - 1.1 Gathering data on software in Macintosh personal computers
 - 1.2 Gathering data on software in PC personal computers that are not part of a network
 - 1.3. Gathering data on software in PC personal computers that form part of a network
 - 1.4 Gathering data on software in servers
 2. Data to be returned to the National Audit Office
 3. Contact person
 4. Assistance
 5. How does the enclosed GASP data collection module work?
 6. Other phases of the survey
 7. Distribution of the full GASP system and its further use
 8. Example of "login script" on servers
-

In the numbered sections 1-5 below follows a description of Phase 1 of the National Audit's survey of the use of illegal software in the institutions covered by the agreement between the Government and Microsoft.

1. General

The National Audit's survey covers software run under the Windows 3.x, 95, 95 and NT, DOS and OS/2 operating systems, and also software run under the operating systems for Macintosh computers.

Two diskettes containing the data-collection module of the GASP system are enclosed; this is used to simplify and speed up the National Audit's survey. One of the diskettes contains a program and specifications for gathering data on software in workstations; the other contains corresponding material for collecting data on the software in servers.

Although the National Audit Office has tested all the diskettes that are distributed in this phase of the survey for computer viruses, it should be pointed out that it is important to check all new programs for viruses, and the enclosed programs are no exception to this rule.

1.1 Gathering data on software in Macintosh personal computers

Start by checking the computer and the supplied diskette for computer viruses.

Diskette No. 1 contains the file GASP_SEA.HQX, which is a compressed checking program for Macintosh computers. As diskette No. 1 is formatted for PC computers, it must be used in a machine that is capable of reading such diskettes. If no such machine is available, please contact the National Audit Office, which will immediately supply the program on a diskette formatted for Macintosh or by e-mail.

Stuffit, Stuffit Expander or a comparable decompression program must be used to decompress the file GASP_SEA.HQX. As there is not room for the decompressed program on diskette No. 1, the GASP program must be installed on the computer's hard disc. Next, run the GASP program by double-clicking it with the mouse pointer. The first time it is run, it is necessary to open "Options" and enter the text "Budget number" in the field User defined field 1. label" and then click "Save". To make a check of the computer, enter its name in the field "Computer Name" and then enter the budget number in the form "00-000" in the field of that name and click the "Audit" field. The check will then begin. When it is finished, the program will write its findings in a field with the extension .sam.

If more than one Macintosh computer is to be checked, copy the program from the first computer to a diskette, which should then be marked "GASP Audit for Macintosh, v4.0 Copyright © 1998 Attest Systems, Inc. All rights reserved." That diskette can then be used to run the program in other computers.

When all Macintosh computers have been examined, all findings must be sent to the National Audit Office. These are marked with the extension .sam.

1.2 Gathering data on software in PC personal computers that are not part of a network.

In the case of personal computers that are not part of a network, it is necessary to run the enclosed software on each computer separately. Prior to doing this, check the computer and the software diskette for computer viruses.

The diskette marked No. 1 contains the programs and specifications that are used to gather data on the software installed in personal computers that are not part of a network. It is not necessary to install the checking software on the computers: it is sufficient to run it on them.

Run the program GASPNET5.EXE directly from the diskette. It takes only 3-4 minutes to run, during which time it gathers data and writes it onto the same diskette. For computers in this environment, data should only be gathered for a maximum of 5 machines on each diskette to avoid having to repeat the entire operation many times if something goes wrong. In this connection it should be pointed out that the disc drives of old PCs may be faulty, causing damage to diskettes that are inserted in them. Storing data on only a small number of machines on each diskette as described above also reduces the risk of spreading computer viruses to a large number of machines.

1.3 Gathering data on software in PC personal computers that form part of a network.

In the case of personal computers that not part of a network, the enclosed software is centrally run. Prior to doing this, check the system and the software diskette for computer viruses.

The diskette marked No. 1 also contains the programs and specifications that are used to gather data on the software installed in personal computers that not part of a network.

Before the system operator can run the enclosed software, he must copy all the files from diskette No. 1 to a region of the net server that is accessible by tall the computers in the network. The programs and specification files on the enclosed diskette are then sent out on the "Read only" setting, and a check must be made to ensure that this setting is still valid after the copy has been made. When this has been done, the program GASPNET5.EXE is added to the "login script" on the network. The program will then run automatically as soon as each user logs into the network for the first time after the program is installed; this takes 3-4 minutes for each computer. It is important to keep the program is on the server for several days to ensure that it has been run on all users' computers. Note that the program must be authorised to create data files containing the findings of the check in the path where the program has been saved. An example of how this can be done in the "login scripts" of the most common network operating systems, e.g. Microsoft NT-Server and various versions of Novell Netware, is to be found in a separate section at the end of these instructions.

1.4 Gathering data on software in servers

It is necessary to collect data not only on the software installed on the hard discs of all personal computers, but also on that installed on servers.

The data shall be gathered from a Windows 95, 98 or NT personal computer, by the system operator or another person with access to all the drives of the server that contain software.

Run the GASP32W.EXE program straight from diskette No. 2. The program will ask for the name of the net server; this must be registered, after which the collection process is started by clicking "Continue". The time required for the collection will depend on the disc space of the net server, and may take anything up to 30 minutes. When it is finished, the program will have written its findings in a file on the diskette.

The collection program is set to examine the F, G, G, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X and Y drives. The Z drive is not checked, since it is common that the F and Z drives on Novell networks refer to the same programs. If the net system is installed in such a way that more than one drive gives access to the same programs, the reference to such drives must be deleted in the [IncFiles] section of the specification file GASPAUD.CFG on diskette No. 2.

2. Data to be returned to the National Audit Office

When the audit module of the GASP system has been run on all workstations and servers in the state body concerned, all files containing the audit findings must be returned to the National Audit; these are files with the extensions .saz, or .sam in the case of Macintosh computers.

This data may be submitted to the National Audit Office on diskettes, Zip drives or by e-mail, to the address postur@rikisend.althingi.is. It should be pointed out that there is no need to compress individual saz or sam files, as these are already in compressed form. On the other hand, if the files are to be sent by e-mail, it is a good idea to compress all saz or sam files together so as to be able to send them in an encrypted form so as to ensure that unauthorised persons will not have access to them. If the PKZIP program is available, this can be done as follows:

```
pkzip -s name.zip *.saz
```

When this command is entered, the PKZIP program will ask for a password to use. When this has been registered, the program will encrypt the data and write it to a zip file which can then be given any name, e.g. MININ.ZIP (ministry/institution), i.e. a budget number. The file shall then be sent to the National Audit Office by e-mail, the password being sent by fax to 562-4546, together with information on the program used to compress the files or encrypt them in some other way.

3. Contact person

The National Audit Office requests that it be sent, together with the aforementioned .sam and .saz data files, the name and telephone number of an employee who can be contacted in the event of problems arising with the processing of the data, e.g. if the diskettes prove to be damaged.

4. Assistance

Tæknival Ltd is the service agent for the GASP software in Iceland. For further information about the system, please contact Tæknival's technical support, tel. 550 4203. This service must be paid for according to Tæknival's scale of charges.

Should any questions arise in connection with the National Audit's conduct of this survey, they will be answered as far as possible at tel. 561 4121. Questions may also be sent by fax to 562 4546 or by e-mail: postur@rikisend.athingi.is.

5. How does the enclosed GASP data collection module work?

It is useful to understand how the enclosed GASP data collection module works. The program GASPNET5.EXE begins by checking first whether the data collection module has already been run on the computer or net server in question. If it has, then nothing happens. If it has not, the program runs the checking program designed for the operating system that is installed in the computer. This is

why diskette No. 1 also contains the programs GASP32W.EXE, which starts up if Windows 95/98 or NT is installed in the computer, GASP16W.EXE, which starts up if Windows 3.x is installed, and GASP16D.EXE, which starts up if DOS or OS/2 is installed.

After this, the following process takes place:

- 1) The program detects the computer's identification number and records it with the data collected.

The program does not record the user of the computer at the time of data collection. The budget number of the party concerned has already been recorded in the configuration program PROMPT.CFG, and this number is recorded with the data collected.

- 2) A check is made to see whether the PC's RTC and BIOS function correctly with the year 2000. It is not advisable to run other programs while this check is in progress.

It should be noted that no test of this type is made on servers at this time, even though it is important to make one. The reason for this is that in many cases the computer system must be taken off line while the test is carried out. Participants in the survey will be able to carry out this test when they receive the full GASP system, which is accompanied by instructions on how to make the test.

- 3) Data is collected regarding the programs that are installed on the hard disc.
- 4) The program records its findings in files marked with the extension .saz.

6. Other phases of the survey

Phase 1 of the National Audit's survey has been described above. When the findings of this phase have been sent to the National Audit, the next phase can begin.

In Phase 2, the National Audit Office will process the data submitted from Phase 1. When this processing is complete, materials will be sent back to the participants in machine-

readable form, containing a list of the software found in the computers of the body concerned. Employees of the bodies will then be requested to add information about their software to these lists, together with any explanations and comments that they wish to submit to the National Audit, and then return them. Also in Phase 2, participants will be sent data that was collected in connection with the Year 2000 problem.

In Phase 3, the National Audit Office will go over the data submitted and then compile a report presenting the overall findings on the situation regarding software licences in state bodies as a whole. When this report has been issued, another will be compiled, based on the data from Phase 1, on how well the computer systems in state bodies are prepared to deal with the “Millennium Bug”, i.e. whether they are prepared for the change of date to 2000.

7. Distribution of the full GASP system and its further use

As the GASP system is a large program, it was considered necessary not to distribute the full system in connection with the National Audit’s survey, as this would necessitate more, and more complicated, work on the part of participants that would be called for if only the data-collection module were distributed.

In connection with the survey, the National Audit Office purchased 10,000 licensed copies of the GASP system. This package includes upgrades for 12 months of the database containing information on programs, and upgrades between Version 5.0 and 6.0. As this software may be of use to participants in the survey, the National Audit Office will send the full GASP system to them after completion of the survey. They will then be able to use it for the general management of their software, and also to assist with solving the Millennium Bug problem. Readers are reminded that Tæknival is the service agent for this software in Iceland.

When the upgrades of the GASP system that are included in the package have been received, they will be sent to the

state bodies that use the program. Later, on the basis of experience, a decision will be taken as to whether further upgrades will be purchased, and if so, how this will be done.

8. Example of login script on servers

Here follow some examples of how login script may be used in networks. These examples are taken from GAPS Getting Started, which can be consulted at the following website if further explanations are needed:

http://www.gasp.com/website/gasp5/gasp_getting_started.htm.

```
REM Netware 3.x
IF MEMBER OF "GASPNET" THEN
MAP ROOT I:=SERVER/SYS:/APPS/GASPNET
SET GNET_PATH= "I:"
#I:\GASPNET5.EXE
SET GNET_PATH=" "
MAP DEL I:
END
```

```
REM Netware 4.x
IF MEMBER OF "GASPNET" THEN
MAP ROOT I:=SERVER/SYS:/APPS/GASPNET
SET GNET_PATH= "I:"
#I:\GASPNET5.EXE
SET GNET_PATH= " "
MAP DEL I:
END
```

```
REM Netware 5.x
MAP I:= \\SERVER\SYS\APPS\GASPNET
SET GNET_PATH= "I:"
#I: GASPNET5.EXE
```

SET GNET_PATH= “ ”

MAP DEL I:

REM NT-SERVER

NET USE I: \\NTSERVER\GASPNET

I:\GASPNET5.EXE

NET USE I: /DELETE

Appendix 2 - Materials Distributed in Phase 2 of the Survey

Here follows the text of the letter that was sent to all the bodies that had submitted materials in Phase 1 of the survey, together with an interpretation of the findings of Phase 1, and also the form of the questionnaire that was sent to them, with instructions on how to fill it in. The informative material sent out in Phase 2 has been incorporated in the body of the report above. In addition these materials, participants were sent lists of the software on their individual personal computers, an overall list of all installed software, a survey of the capacity of individual computers to meet the year 2000 and an overall survey of the capacity of the installed software recognised by the GASP system to cope with the change of year to 2000. Also published below is the letter of reminder that was sent out to those who had not returned the questionnaires by 3rd November 1999.

<Name of state body> 24th September 1999 RÁ-STO

<Address>

SP/bb

<Post code> <Municipality>

The National Audit Office has now processed the materials submitted in Phase 1 of the survey of the use of illegal software in state bodies in Sections A, B and C of the budget. This phase included an investigation of the software installed in computers in the state bodies and the capacity of both computer hardware and software to deal with the change of date to the year 2000. The findings of Phase 1 are enclosed with this letter.

For various reasons which will not be discussed here, there has been a delay in processing and sending out the enclosed materials. Consequently very little time remains for the completion of phases 2 and 3; Phase 3 will consist of the processing of data from Phase 2 and the publication of a report. It should be pointed out that under the agreement between the Government and Microsoft, the survey of the legal status of software was to be completed last May and illegal software was to have been eradicated by the end of this year.

Phase 2 of the survey is now starting. This consists of investigating the legal status of installed software. For this purpose, this letter is accompanied by a questionnaire with instructions as to how it is to be filled in. It is requested that replies be sent to the National Audit Office **by Monday, 25th October 1999, at the latest.** In view of the delay that has already occurred and the fact that the findings of the survey are supposed to be an aid to the RUT Committee for the eradication of illegal software by the end of this year, it is not possible to extend the deadline for the return of materials from Phase 2 of the survey beyond this date.

When the National Audit Office has processed the materials, the replies received will be entered in a single

common database which will be used to process overall findings regarding the legal status of software in use in state bodies. When the survey is complete, this database will be deleted.

The National Audit Office has asked Attest Systems Inc. to grant registration keys for the use of the GASP system by the participants in the system. Each participant will receive a registration key for the number of computers found Phase 1 of the survey. When the registration keys have been received, the National Audit Office will send them to the participants, together with a CD containing the full GASP system.

Enclosed on a diskette:

- 1) Questionnaire, see RÁ-STOsp.xls.
- 2) List of software installed in individual computers, see RÁ-STOde.doc.
- 3) Overall survey of installed software, see RÁ-STOex.doc.
- 4) Survey of the capacity of individual computers to deal with the change to the year 2000, see RÁ-STOHW.doc.
- 5) Survey of the capacity of software to deal with the change to the year 2000, see RÁ-STOsw.doc.
- 6) Information to be submitted when licences to use software are purchased, see kaup.doc.
- 7) Classification of software and software licence types, draft, see fraeefni.doc.

Enclosed on paper:

- 1) Instructions on filling in the questionnaire.
- 2) Interpretation of the findings by the GASP system in Phase 1 of the National Audit's survey.

24th September 1999

Interpretation of the findings by the GASP system in Phase 1 of the National Audit's survey of the use of illegal software in state bodies

The contents of this document were for the most part connected with the tests carried out in connection with the change of the date to the year 2000, and are therefore to be found in the National Audit's report dealing with the capacity of software and computer hardware in state bodies to deal with the change to the year 2000, which was published in September 1999. Material with a bearing on the present report has been incorporated in the main body of the report.

Questionnaire sent in the form of an Excel document:

Assets of inst./comp.?		Number?													
Workstations:															
Servers:															
A	B	C	D	E	F	G	H	I	J	K	L	M	Explanations:		
Examples of results:				No of users on server	No of copies in work-stations	licence kept by body?	licence kept by others?	No of user licences to be bought?	No of copies to be deleted?	No of user acc. restrictions?	No of user betw. col E - F and G - K.	Explanations to be given here if differences occur in numbers			
RA-STO:	Producer:	Name of software:	Vers.?												
00-000	ACD Systems Ltd.	ACDSee 32	2	0	1							1			
00-000	Hugbúnaðagerðin hf.	HG ritvinnsla	3.0	0	1							1			
00-000	Microsoft Corporation	Windows 95		0	1							1			

24.9.1999

Instructions on filling in the questionnaire in Phase 2 of the National Audit's survey of the use of illegal software in state bodies under Sections A, B and C of the budget.

The enclosed diskette contains a questionnaire in the form of an Excel 4.0 file, RÁ-STOsp.xls, which most spreadsheet programs should be able to open. The aim of sending this questionnaire is to investigate the number of software licences relating to the software installed in computers in the institution/company as revealed in Phase 1 of the National Audit's survey of the legal status of software in use in state bodies.

For those who are not aware what materials purchasers should receive when they purchase licences to use software, information on this point is supplied on the accompanying diskette in the file kaup.doc, in Word 2.0 format, which most word-processing programs should be able to read. The diskette also contains the file fraeefni.doc, which contains a classification of software licences on grounds of both copyright and software licence types. All state institutions and companies must have access to knowledge of these matters so that:

- 1) they can avoid purchasing illegal software,
- 2) they will definitely have the evidence necessary to demonstrate the legality of their installed software, and
- 3) they can answer the National Audit's questionnaire.

The questionnaire does not include questions about all installed programs

As can be seen from the list of the software found in the institution/company on the enclosed diskette, the questionnaire does not contain questions about all the software copies found installed in the computers of the institution/company. The enclosed document on the

interpretation of the results produced by the GASP system in Phase 1 of the survey shows clearly the programs that appear in these lists and those that do not, and the reader is referred to the information presented there. Descriptions of these points are also to be found in the recently published report by the National Audit Office of the capacity of computer hardware and software in state bodies to deal with the change of date in the year 2000.

In the aforementioned lists generated by the GASP system, programs are counted twice because they occur in software suites, i.e. the constituent programs in each suite are counted, and the suite itself is counted. In two instances in the questionnaire, the questions refer only to licences for the suites themselves, which is in accordance with the rules on software licences applying to this type of software. If Office 95 is installed in a computer together with Version 7.0 of the user programs Word, Excel, Power Point and Outlook, the question refers only to a licence for Office 95. The same applies if Office 97 is installed in a computer together with Version 8.0 of the user programs Word, Excel, Power Point and Outlook: the question refers only to a licence for Office 97.

The programs Internet Explorer, Net/Meeting and Outlook Express have been removed. These programs are supplied with the Windows operating system. It is only asked whether a licence exists for the operating system, because if it exists then additional licences can be obtained for the other programs.

The questionnaires do not ask about licences for software products such as, e.g., Acrobat Reader, or for the programs BÁR-ET and the State Property Register, which the National Accounting Office distributed to state bodies without any software licences being supplied.

Finally, it should be mentioned that no question was asked regarding the GASP system, as licences covering it are now in the keeping of the National Audit Office.

When the questionnaire has been filled in, it should be returned to the National Audit Office by Monday 25th October 1999 at the latest.

Description of the individual columns in the questionnaire and instructions on filling it out.

1. Questions on the computer hardware owned by the institution/company.

At the top of the questionnaire is a question about the personal computers owned by the institution/company. The numbers of workstations and servers are to be registered in cells C2 and C3. Questions are included on these points in order to investigate whether there is a discrepancy between the number of computers in the data submitted in Phase 1 of the survey and the number owned by the state body concerned.

2. Questions connected with licences for the software

Columns A-F contain data from the materials sent in by the state body in Phase 1 of the National Audit's survey; columns G-M have been set up by the National Audit Office.

The columns in which data is to be recorded are columns E and G-M. Data is to be entered in every line, i.e. in respect of each version of each software package.

Column A: RÁ-STO

This contains the budget number (ministry-body) from the material submitted.

Column B: Producer

The name of the producer/copyrightholder of the software.

- Column C: Name of software
The name of the software.
- Column D: Version number
The version number of the software.
- Column E: Number of users (clients) on the server
The number of copies of the software in column C that were found on diskette No. 2, the GASP data-collection module for servers.

As a “remote” method was employed to investigate server drives with the GASP software, whether all the software installed on each server was detected or not depended on the access level of the person who initiated the investigation. Although it was stated in the instructions from the National Audit Office that the person carrying out the investigation would have to have the right of supervisor access to the entire server, it is clear from some of the data files that were sent to the National Audit Office that this was not always the case.

If the access permitted was insufficient, then for example the operating system of the relevant server, or the service programs installed on it, may be missing from the questionnaire. When this happens, the institutions must lengthen the list of software by adding information on the type and version of the network operating system that is installed on the server and also information on the database server, mail server, etc., installed on it.

Frequently, it is technically possible to install software in three different ways: a) only in workstations, b) only on the server, so that the workstations run it from there, and c) by means of a mixture of a) and b), so that the software is both on the server and in the workstations.

NB: If software is installed on a server, the number of copies appears in this column. Because many people are
--

able to use the software when the installation is of this type, the number of those who use the software must be recorded as an addition to the number of copies now recorded in the column.

- Column F: Number of copies in workstations
The number of copies of the software in Column C that were found on diskette No. 1, the data collection module of the GASP system, appears in Column F. If the diskette was also used for servers, then the number of copies installed on the server will appear as copies installed on a workstation. In such cases, these copies must be deducted from this column and data on the users of the copies on the server must be entered in Column E (see above for instructions on how to make entries in that column).
- Column G: Number of users according to licences kept by the body
Here is to be recorded the number of users according to the licences purchased and held by the body concerned. For example, if the body has purchased licences for 20 users, this is the number to be recorded here.
- Column H: Number of users according to licences kept by others
For various reasons, licences may be in the keeping of parties other than the users of the software. The most common reason is presumably that state bodies have purchased computer hardware with software on a financial leasing agreement. In such cases, the custom is generally that the lessee does not receive the software licence; this is kept by the lessor, whose responsibility it is to ensure that everything is above board. In such cases, the bodies are to record in this column the number of users permitted under the leasing agreement.
- Columns I-K: Action taken regarding illegal numbers of users or software copies
If an institution/company does not hold licences for a particular type of software, or for all the copies of it that have been installed, this constitutes an instance of illegal

use which must be put an end to. Action taken in response to such a situation may take the form of purchasing licences for the particular number of users, deleting a particular number of software copies or restricting the access of a particular number of users to the software. The numbers involved in these measures shall be recorded in the relevant columns in the questionnaire.

Column L: Difference

This column shows the difference, if any, between the sum of the numbers in Columns E and F less the sum of the numbers in Columns G-K.

Column M: Explanations

This column is for explanations in cases where a difference has been recorded in Column L. Other explanations or comments which the institutions wish to make regarding individual software packages may also be entered in this column.

The following letter of reminder was sent out the state bodies that had submitted data in Phase 1 but had not replied to the questionnaires by the time it was sent.

Institution 3rd November 1999 SP/bb
Address
Postcode

On 24th September 1999, your institution was sent materials in connection with Phase 2 of the survey by the National Audit Office of the use of illegal software in state bodies. These materials included a questionnaire on software licences held. The deadline for returning the completed questionnaire was Monday 25th October 1999.

This is to draw your attention to the fact that the aforementioned questionnaire has not yet been returned by your institution, and to request that this situation be rectified immediately.

The National Audit's survey is now entering its final phase, and a report is due to be published shortly on the overall findings regarding the legal status of software in use in state bodies. The National Audit's survey has been made in accordance with an agreement made between the Government and the Microsoft Corporation. Consequently, it is obvious that those state bodies that do not submit the data requested before work on the report is complete can expect to have to give an account of their software resources and their use in another manner, and to parties other than the National Audit Office.

Sigurður Thórdarson
Auditor General