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**BEST PRACTICES IN DESIGNING
WEBSITES FOR DISSEMINATION OF
STATISTICS**



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PREFACE

The methodological material “Best practices in designing Websites for dissemination of statistics” was prepared at the request of countries participating in the activities of the Work Sessions on Statistical Metadata organised by UNECE Statistical Division within the programme of work of the Conference of European Statisticians. This material has a link to the “Guidelines for statistical metadata on the Internet” (published in 2000 in the “Conference of European Statisticians Standards and Studies’ series” under no. 52). Its aim is to give more detailed recommendations for Website design following the principles outlined in the “Guidelines”.

The document was prepared by the UNECE consultant Lars Rauch from Statistics Sweden in cooperation with experts of the UNECE member countries and international organisations. It was reviewed at the Work Session on Statistical Metadata in November 2000. National Statistical Offices of the UNECE member countries and Eurostat, the European Free Trade Association (EFTA), Food and Agriculture Organisation (FAO), International Labour Office (ILO), International Monetary Fund (IMF), Organization for Economic Cooperation and Development (OECD), United Nations Educational, Scientific and Cultural Organisation (UNESCO), United Nations Industrial Organization (UNIDO) and United Nations Statistics Division (UNSD) participated in this meeting. The material reflects the outcome of the discussion on the document.

At its 2001 plenary session, the Conference of European Statisticians agreed to publish this methodological material and to distribute it to interested statistical offices and other users.

SUMMARY

The aim of the publication "Best practices in designing Websites for dissemination of statistics" is to assist national and international statistical offices in outlining the strategy for disseminating statistics through Internet. The publication is complementary to the methodological material "Guidelines for statistical metadata on the Internet" and considers in more detail the practical issues of implementing statistical Websites. It gives an overview of Website users, website content, architecture, functions, the development and maintenance issues, usability, and the success factors for a statistical website. The paper aims to contribute to a broader harmonisation in the use of web technologies for statistical offices.

Internet is becoming increasingly important as a dissemination channel for statistical data and the role of statistical Websites will increase accordingly in the future. Internet offers greatly extended possibilities for a statistical office to serve its users. At the same time, it represents a permanent challenge to adapt to the new facilities and to maintain the necessary competence. In nearly all statistical offices today, the question is more about the problems of managing websites and reengineering existing ones rather than whether a website should be developed and implemented or not.

It could be recommended to specify the goals and success criteria for a statistical website before its launching, design or reorganisation. It is not easy to define the success criteria. Some examples of what could be measured are: income from selling statistics via the Website, decreasing dissemination costs, frequency of visits, number of users, number of downloads, amount of user feedback, etc. The following list should provide some guidance for the most critical success factors for implementation of a statistical website:

- **Users.** They have to be the centre of attention. It is important to investigate who the users are, what they really need, how they use the data, what their competence levels are. At least some kind of usability test should be organised, be it even with very simple tools. Usability studies provide an essential feedback that permits improvement of the website and, in the long term, reduces costs necessary for redesign.
- **Maintenance.** The development and maintenance of the website of a statistical office should not just be the task of IT-experts and special dissemination staff. Strong support among the (top) management is one of the most essential success factors for a statistical website. It must be ensured that the necessary competence to develop and maintain a website is available.
- **Search and navigation.** The website architecture must provide comprehensible navigation across the whole website. It must be easy to find the desired data inside the website. The response time must have high priority.
- **Interpretation.** A flexible and consistent metadata support should ensure that the published statistical data is transparent and comprehensible to the users; any kind of misunderstanding and misinterpretation should be avoided. The metadata should support the comparability of data over time, i.e. historical data should be supported by metadata. The published statistical data must be consistent across the whole website.
- **Post-processing.** The user must be able to download data into his/her own technical environment. The data should be provided in well-accepted standard formats.

I. INTRODUCTION

Web technologies have evolved during the last years into one of the most important information channels and constitute one of the backbones in the development of what is called the information society. This has, of course, also been recognised as a big challenge by national and international statistical offices. Nearly all national and international statistical institutes have developed and implemented web sites. During the last years the Internet technology - and in particular the web technology - can be considered as probably the most important development in the area of information dissemination. Today it is difficult to foresee Internet development over the next ten years. But it is certain that electronic dissemination will take over a rapidly growing part of the entire output of a statistical office. This will lead to extended use of web technologies, to larger and more complex statistical websites, higher expectations of statistical users, etc., which will lead in turn to higher demands on the implementation of websites. There will be increasingly forceful requests to standardise basic statistical functionalities on the website. In particular, electronic dissemination will have a great impact on the standards for data exchange and the use of metadata. It can also be foreseen that the rapid evolution of Internet use will require a higher degree of metadata standardisation across the national and international statistical offices around the world.

The Internet is used today for a number of purposes and the scope of usage will continue to grow. The Internet can be considered as a worldwide network linking together resources from all over the world. The Internet functionality already has an important impact on the basic information technologies. There is an increasing trend towards Internet technologies replacing the traditional IT architecture. Internet technology today is composed of a number of functional features:

- ◆ Electronic mail (E-mail) is the basic function of the Internet. E-mail is a common engine to send electronic

messages to anybody in the world who has an e-mail address. E-mail may contain short or long messages and any files can be attached to the message. The e-mail function has been connected to a number of software packages that allow software controlled sending of e-mail messages and including attachments such as files with statistical data, for instance. Powerful standard software has been developed to manage electronic mail systems.

- ◆ Websites are the most widespread and visible Internet facility. The web technology offers many different functional possibilities.
- ◆ FTP¹ -server is a basic function to disseminate data files.
- ◆ Browsers and mailing software are software packages used on the users workstations to manage the Internet functionalities. They provide access to websites and FTP-servers, and enable receipt and sending of e-mails. MS Explorer and Netscape are probably the best known and most widely used browsers in the world today.

Within the frame of this basic functionality, a growing number of application areas have been developed. Etrade, business-to-business, represents one of the latest Internet issues. But not all these issues are of great interest to a statistical office, at least not yet.

This paper will not focus on technical questions of development and use but rather on issues related to the use of web technologies for statistical websites from the user's point of view. The real starting points for this paper are the following documents that have already been discussed at different meetings:

- ◆ Guidelines for Statistical Metadata on the Internet - UNSC/ECE – CES Statistical Standards and Studies, No. 52, 2000.

¹ FTP - File Transfer Protocol

- ◆ Guidelines for the Modeling of Statistical Data and Metadata - UNSC/ECE CES methodological Material, 1995.

The present paper may be considered as a continuation of the above-mentioned documents. The content should not be seen as final conclusions, rather as a further step in the discussions that hopefully will lead to a broader harmonisation in the use of web technologies for statistical offices.

II. THE USERS OF A STATISTICAL WEBSITE

It would probably be worth making a distinction between visitors and users of a website. A visitor can be anybody who is surfing the web and who accesses a website almost by accident. A user is a visitor who wants to apply the content of the website for some specific purpose. The difference between visitors and users is not necessarily clearly defined and they may overlap each other; visitors may become users, and vice versa.

The real users are the crucial purpose of any website. If you have no users at all the website is probably more or less unnecessary and useless. Although the number of Internet users is growing rapidly, it is still a limited resource for a particular website. There is tough competition on the market to attract users to a website because it is ultimately the user's decision as to whether he/she wants to access a certain website or not. Users vary greatly; a certain group of potential users must normally be attracted to a given website. In most cases some marketing activities will be required to reach the desired frequency of website access.

A statistical office cannot control what kind of visitors and users will access its web pages. It is possible to restrict access to certain users by providing user-id and passwords, at least to some sections of the website. Any kind of access restriction should be well motivated – for commercial reasons, for example. On the other hand, it would be of great interest to

know who is accessing the website, and maybe also why. There are software tools available on the market to make some rough estimation of user access, but this is not sufficient for deeper analysis. To obtain a better grasp of the user situation, some communication is necessary, for instance:

- ◆ Register of all users who are using certain services on the website;
- ◆ Provision of feedback facilities for the users.

In general, users (visitors) can be classified in different ways. One possible distinction could be:

- ◆ Occasional users and users visiting the web pages by accident;
- ◆ Regular users who need the information for their work (e.g. journalists) or who are for other reasons interested in the information;
- ◆ Professional users, who for their original work have to use statistical data and information and who want to obtain it from the website;
- ◆ Researchers and advanced users who are looking for information for their research work and for further processing and analysis.

Another distinction between different user types could be:

- ◆ Individuals who are interested in statistical information but not necessarily for professional reasons – the interested citizen;
- ◆ Private and public institutions, for example companies, governmental bodies, etc.;
- ◆ Scientific institutes and universities who want to use statistical data for their own research.

Of course, there does not exist a clear specification and general definition of different

kinds of users; they will normally have very different needs concerning both the content and the methods of using a website. A clear user policy is a prerequisite for success, for instance:

- ◆ The website should be of interest to a broad audience;
- ◆ Focus on a target user group has to be defined carefully.

Such a policy will influence both the layout, the content and the offered functionalities of web pages. Different parts of the website may be dedicated to different kinds of users.

Another important question is whether the website is oriented only to users of that country, i.e. users who understand the national language, or whether the website should reach an international audience. In the latter case, a multilingual approach should be chosen for the website. Publishing a website in different languages is a particular burden that should not be underestimated. However, for a large number of NSO's it is very important to offer a multi-lingual approach, especially in the case of multi-lingual countries.

A sound strategy would be to serve several groups rather than to focus on just one kind of user. All of them can play important roles on the customer's side of a statistical office. In general, the users should always be the centre of attention of the work of a statistical institute. Specific needs of the different user groups will be considered within the following chapters embedded in the web design issues.

To be successful, it is essential to study not only information requirements but also the behaviour of different users. Modern methods such as Use Case Studies could be very helpful in making different specifications. The expectations of different kinds of users and a knowledge of how the users really want to work with a statistical website should guide the design of a website both from the contents and

the technical point of view. It should also be recognised that the behaviour and needs of a group of users may change over time. Therefore, the maintenance of a website has to take such problems into account.

Changes in user behaviour may be due to many different reasons, for instance the implementation of new facilities in the Internet world, or the gaining of more experience may lead to new demands, etc.

III. WEBSITE CONTENT

Once a statistical office has stated that the website will be the main distribution channel of statistical information, then the content of a website could be defined as the main output repository of the office. This includes traditional publications as well as a number of new outputs due to the functionality of Internet technology.

Basically, a user will expect statistics from a statistical website. Statistical information can be provided in various shapes and sizes. The content of a statistical website may consist of:

- ◆ Fixed statistical tables with key figures and other basic statistical data;
- ◆ Statistical publications in a web-readable format, i.e. publications containing text, figures, graphics, maps, etc.;
- ◆ Pre-defined tables, time series, etc. - for instance, for downloading or further processing;
- ◆ Flexible access to databases;
- ◆ Download functions for tables, publications, etc.;
- ◆ Information about the statistical office – organisational structure, responsible staff, contact persons, etc.;
- ◆ General description of main activities, statistical subject areas, available services, etc.;

- ◆ Links to other statistical and related sources.

There may be a kind of redundancy in presenting statistics according to the different needs of various types of users. To avoid any inconsistencies between the different presentation methods, it is recommended to develop a unified output data source for the available statistical data. One database system – an output database - behind all publications would be very helpful in this respect. Such a database system can be organised in different ways; it could be a central resource or a well-organised distributed system within the office. The implementation of a statistical data warehouse system would be a useful tool to integrate statistics from different subject matter areas and to offer external users an integrated view of the whole statistical system.

At this point it should be stressed that it is not only a question of good navigation to find statistical information on the website. A good search function should be supported both by navigation tools and statistical metadata. In many cases, the user wants to start the search by using metadata. He/she needs statistical metadata for a number of other purposes when using a statistical website.

The availability of metadata should support and provide:

- ◆ Searching data (as already mentioned);
- ◆ Understanding and transparency of the content of data:
 - Definition of variables, classifications, etc.;
 - Description of statistical surveys providing statistical data;
 - Information about data quality;
 - Etc.;
- ◆ Information about important events with an impact on data. Such events could be the redefinition of statistical variables, absence of data for certain time periods,

external events with an impact on statistics – e.g. a new regional structure, etc.;

- ◆ Contacts to the responsible department in the statistical office, contact person, etc.;
- ◆ Presentation of the statistical office, its position in society, its responsibilities, etc.

The use of metadata on the website requires that the metadata be consistent across the entire system. To achieve this goal, a good metadata system behind the website publishing of statistical information is necessary. A standardised metadata resource for the statistical system, not only for the web publishing needs, would be helpful. It could ensure that an agreed standard set of metadata will be maintained in one place and distributed to the different system applications from that source. For this purpose, office-wide metadata standards must be defined. It would be a great advantage to be able to define more metadata standards that are valid on an international level. There already exist a number of standardised metadata in the form of international classification standards. But these standards should be extended to obtain well-accepted standards for the typical metadata object types such as variable, value set, classification as such, etc. Some cooperative work has already started in this field between certain NSO's for some statistical areas. Metadata standards will be an emerging issue for the harmonisation of the presentation of statistical information via websites covering different statistics of different countries.

The dissemination of statistics via Internet using websites requires the standardisation of the transmission of statistical data. Statistical data must be provided in a well-accepted format that can be used to import data into software packages used by the customer. GESMES is such a format, used for data exchange between Eurostat and NSO's.

XML is on the way to becoming a standard method for the exchange of data between different technical environments. The use of XML for the exchange of data requires a certain degree of standardisation of metadata to

be able to use the real advantages of such an open format. Downloading of statistical data in XML format will probably be the most widely used format in the near future.

IV. WEBSITE ARCHITECTURE AND FUNCTIONS

IV.1 Website architecture

A website consists of a number of Web pages that have to be linked together. A Web page itself may consist of a number of areas with different functionalities. A large website can consist of several thousand Web pages containing many cross-references and links to other websites. Because such an architecture can be extremely complicated, it is necessary to maintain complete control of the website, otherwise it may become very confusing for the user.

Definition of the content of Web pages and the style of presentation are two different things. A bad presentation can destroy the content and discourage users from accessing the website. There are a number of sensible rules regarding the creation of a Web page, but the web designer must always bear the expectations of the target audience in mind. Examples of what should be considered when developing a website are:

Response time

This is a very important issue which affects the entire website. The user does not have time to waste waiting for website response. This is a very sensitive issue; the user may be in any of the following situations:

- ◆ He/she may be a new or occasional user who wants to visit a website, sometimes by accident. This user will normally surf away quickly if the response time is too long, i.e. several seconds. He/she will probably never come back;
- ◆ He/she may be a professional user who needs the information. He/she is obliged to

wait, but will not be happy about it, i.e. an unsatisfied client.

The basic rule should be to avoid all unnecessary features which may provide a “sophisticated” layout but which are time consuming. The normal user of statistics is very rational and wants to obtain all kinds of information as rapidly as possible. Glossy images, many colours, complicated structured pages are mostly useless to such users. The website should not abuse the users’ time.

Of course, depending on the application, response time may be longer as in the case of downloading data, for instance. But it is a high priority task to keep response time as brief as possible.

The Home Page

This is the starting page of a website, i.e. it is the normal entry point to the website. Visiting this page will give the user his first impression of the whole website. A good design of the home page should never be underestimated. It should appear rapidly (response time), be well structured with a plain guide how to continue. An overview of the contents of the website with links to the different sections could be a common rule. Of course, it must be very clear which organisation is presenting the website. The home page may already contain some statistical key figures on condition that they really are important and are always maintained up-to-date.

Navigation

One of the basic user interactions with a website is clicking from one Web page to another. Navigation through a website should be comprehensible and efficient from the user’s point of view.

- ◆ All texts on a Web page with underlying hyperlinks should be distinguished from plain text. The links provided should help the user to find the quickest way to the desired information. It is therefore

important to examine how different users utilise the website.

- ◆ The user should never become lost in the website. It is most irritating to be somewhere on the website without knowing how to continue in a meaningful way. There should always be a hyperlink at least to the home page. But this in itself is often not sufficient. A website with a clear structured architecture should always provide hyperlinks some steps back to the beginning of a certain section. If the user enters an area where a user-id is necessary, he/she should not be automatically thrown out by accidentally clicking on a hyperlink. The implementation of links on a website should be undertaken very carefully.
- ◆ The website should provide hyperlinks to other websites when useful for the user.

Physical Website architecture

The physical website architecture may not be so important to users, since in most cases it is hidden from them. The key issue for users is the navigation structure. However, for the maintenance and further development of a website, a good architecture is very helpful. The physical design of a website can be compared with the design of a software program. Modularity, clear logical structure and good documentation are rules that should also be applied when designing a website.

Web page design

Of a much greater relevance for the use of a website is the design of web pages. There are a number of problems the designer has to solve.

- ◆ The available monitor and the chosen resolution limit the visible part of the physical size of a page. This is a crucial point for web page design because users are equipped with different displays. A good compromise should match the available equipment of the majority of users. The availability of displays changes over time; 17" displays and a resolution of

1024x768 pixel are now standard in many countries.

- ◆ It would be ideal if the physical size of a page corresponded to the physical parameters of the screen. But it is often difficult to limit the size of a page to these parameters. Even relatively small statistical tables would be too large. When publishing such tables, the user must scroll so that all parts of the page become visible. Scrolling can be done vertically and/or horizontally, but it is commonly accepted that horizontal scrolling should be avoided if possible. Another rule should be that the content of the visible part of a table should always be comprehensible, i.e. the column head and stub labels should not disappear during scrolling.
- ◆ Resolution independent web page design solves some of the problems related to the different monitor types. Instead of using fixed pixel size objects, the layout in percentages of the available screen area is specified.
- ◆ Browser independent design is another important issue that has to be considered carefully when designing web pages. There are different browsers on the market and different versions of the same browser. The web design should take market leading browsers into consideration, and also earlier versions of the browsers, maybe back two earlier releases.
- ◆ The structure of the web pages should be clear and easy to understand - they should be consistent throughout the whole website. The same functionality should always be represented on the web pages in the same way. As an example, an "OK" function should be a button with the same graphical representation on all Web pages. Different names for the same function must be avoided, e.g. "OK" in one place and "Finish" in another.

IV.2 Website functions

The technical functionality of a website can be static or dynamic. Both are useful for a

statistical website but the dynamic aspects of a website will probably be more the focus of future development. The development of most statistical websites started with the use of static Web pages, i.e. Web pages that are pure publication pages connected by a chain of links. The user can go from one page to another but no real interaction by the user is expected, nor is it possible.

Typical applications of static Web pages are:

- ◆ Publication of documents;
- ◆ Simple search functions in Web pages and published documents (these could to some extent be considered as dynamic features but no real dynamics is involved);
- ◆ Static or fixed tables, graphics, statistical maps, etc.
- ◆ All sorts of administrative information on a website, for instance information about the office, responsible staff, etc.
- ◆ Download functions of pre-specified statistical data.

Dynamic Web pages require interaction by users. The user will control his/her work with the website and will be in the position to decide and select what information should be provided. This means that the user is not only clicking and selecting from already prepared alternatives (which can also have a very dynamic aspect), but he/she is controlling the processing of requests. The user can specify requests that are processed on the server side. The following should be considered as dynamic web features:

- ◆ Flexible database access, where the user can select data for presentation on the website or for downloading;
- ◆ Remote data processing, e.g. with web enabled tabulation systems, dynamic time series processing, dynamic graphic presentation systems, etc.

To achieve such flexibility, it is necessary to provide an appropriate background database environment. Output databases and output-oriented data warehouse applications appear to be the fundament of dynamic websites of a number of national statistical offices.

Web technology can also be used by the website publisher to actively communicate with the users. Registered users could automatically obtain information about website news by using the e-mail function. The user will be informed when and what kind of new statistical information is available. This can avoid unnecessary visits to the website. It is also possible and certainly useful to provide a service sending updated statistical data automatically by e-mail. For instance, when data is updated in a database, the updated data will be sent automatically to customers when they subscribe to such a service.

Data collection via Internet is another hot topic for statistical offices. Although it does not belong to the dissemination aspect of statistics, it should at least be mentioned. The collection of data is still one of the largest and most costly burdens for a statistical office. The use of Internet for data collection will be introduced according to the development of the Internet infrastructure in a country. It can be expected that this will improve data quality and will reduce costs. The web technology provides a new technological platform, and will in future also be used to collect data from the respondents of statistical surveys through the use of electronic questionnaires and other kinds of interfaces to fill in data.

V. DEVELOPMENT AND MAINTENANCE ISSUES

In almost all statistical offices today, the question concerns the problem of managing websites and reengineering of existing ones rather than whether a website should be developed and implemented or not. Printed statistical tables and publications are still the most common methods used by a statistical

office to visualise its results to society. The Internet has started to change this and development will continue. In a number of countries, the website of a statistical office is the real entry point for external users. In the future, printed publications will almost certainly be of increasingly less importance as the website evolves into the most essential dissemination channel.

The development and maintenance of the website of a statistical office should not be the task solely of IT-experts and special dissemination staff. Support by the high level management of the office is one of the most essential success factors. Concerning the administration of the website of a NSO, an Editorial Board could be set up with representatives from all departments contributing to the website. It would be a good idea to include main external users in such a Board. The Editorial Board could be responsible for:

- ◆ Maintenance of the content;
- ◆ Website layout;
- ◆ General structure of the website;
- ◆ General functionality of the website;
- ◆ Organisation and administration of the maintenance of the website;
- ◆ Definition and specification of procedures to load and update the website;
- ◆ Technical development of the website;
- ◆ Etc.

It is necessary to have a clear picture of the administrative organisation of a website, but there may also be a tendency to over-organise website management. In large organisations such as national statistical offices, it would normally be more efficient to implement a certain distribution of responsibilities within the office. Subject matter departments should be responsible for loading the website with statistical information following the general rules agreed upon in the editorial board.

The website maintenance can be divided into:

- ◆ Technical maintenance and development; and
- ◆ Maintenance of the content.

The NSO should have a clear strategy as regards the technical development of the website. The development of the Internet is very rapid, both in terms of the functionality and of the available power and capacities. The possible transfer rate of data via Internet is growing. Transfer rates that are one hundred times faster than those of today will be available. This will dramatically change the possibilities of using Internet for dissemination of statistics, and such a developing technical infrastructure represents a great challenge for statistical offices. This development will not be equally swift for all users - in a number of countries it will take some time, maybe years, before new technical features are common to all users. In other words, there will be users with high speed connection of 2 Mb transfer rate and others with a normal modem speed level of 56 Kb transfer rate. The development of the website must take both types of users into account, which is a new dimension in defining different kinds of users.

A strategic decision policy should express whether the statistical office will be in the fore of this development or will follow it with a certain delay. A NSO should probably not attempt to be a beta tester of all new Internet facilities, but should rather wait until such facilities are well enough established in the country. Such a policy should be used for:

- ◆ Application of new software versions;
- ◆ Expected hardware conditions at the user's site (e.g. screens, power, transmission speed, etc.)
- ◆ Application of new Internet functions.

On the other hand, a NSO should not wait too long before using new facilities. A

good balance for implementation of new developments should be maintained.

Another important issue with a great impact on development and maintenance is the available human capacity and competence in the office. Competence is necessary for:

- ◆ Website design, layout;
- ◆ Technical website development;
- ◆ Development and maintenance of the necessary IT infra-structure;
- ◆ Administration of customer relations;
- ◆ Etc.

Based on the strategic decisions and the available human and technical resources, the appropriate tools for the development of a website have to be chosen. Basically, it is necessary to take a decision on:

- ◆ Web server software
- ◆ Website development tools

Commercial software is available both for the UNIX and the Windows platforms. Normally, it would not be advisable to include another platform in a website than the one used for the server side of the statistical production system. In particular, the choice of website development tools should be made in relation to the available development resources and the level of envisaged ambition. There are a number of relatively easy-to-use tools available on the market that do not require a very high level of programming knowledge.

VI. SOME BASIC CONCLUSIONS

As already mentioned, the development of the Internet and the whole communication structure is still at a preliminary stage. Although we have already seen more than one decade of development, the potential functions that can be related to the Internet will continue

to increase in number rapidly. The Internet technology will also have a strong impact on the whole IT infrastructure. Operating systems and application software will be progressively adapted to the Internet technologies. The obvious differences still experienced when working with Windows or Internet will gradually disappear. New operating systems will integrate the Internet approach to a much higher degree and will take over the role of the basic software in our desktop computers.

It appears evident that the communication infrastructure in the world will evolve towards a real worldwide network. If authorised, an Internet user should be able to link his/her computer to any other connected computer in the world, and the connection will work at high speed. Such a future will offer greatly extended possibilities for a statistical office to serve its users. At the same time, this future represents a great challenge to adapt to the new facilities and to keep the necessary competence up to date.

Regarding success factors of a statistical website, perhaps a definition of success should be considered. This is not so easy and the success of the website will differ from that of a commercial company. What should be measured? Some examples:

- ◆ More income for the NSO by selling statistics?
- ◆ Less printed output, because the user can obtain it via the website?
- ◆ High frequency of visits, many users?
- ◆ Many downloads?
- ◆ Many questions and comments from users?
- ◆ Decreased dissemination costs?

It would be recommendable to specify the goals and success criteria before implementing a statistical website.

What could be the most critical success factors for a statistical website? The following list should provide some guidelines:

- ◆ The users have to be in focus;
- ◆ It is important to map out:
 - Who the users are;
 - What they really need;
 - What they are doing with statistical data;
 - How they work with statistical data;
 - What different competence levels can be expected from users;
- ◆ The development and maintenance of a statistical website must have strong support among the management, in particular among the high level management of the statistical office;
- ◆ The necessary competence must be available in the office, either through staff already employed or through the engaging of external resources;
- ◆ The published statistical data must be consistent across the whole website;
- ◆ A flexible and consistent metadata support should ensure:
 - The published statistical data must be transparent and comprehensive for users; any kind of misunderstanding and misinterpretation should be avoided;
 - The metadata should support the comparability of data over time, i.e. historical data should be supported by metadata. This is important for time series, etc.;
- ◆ It must be easy to find the desired data inside the website;
- ◆ The user must be able to download data into his/her own technical environment. The data should be provided in well-accepted standard formats;
- ◆ The website architecture must provide easy-to-understand navigation across the whole website;
- ◆ The response time must have high priority.

Depending on the main purposes of the website, these success factors will be of more or less importance. There may be still more success factors that should be included. What should be recognised is that the success of a website depends on a number of different factors and the whole website can easily fail if only one important factor fails.

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