

## Reconciling Conflicts in

## Reporting

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## Introduction and Overview

*Author: Kai Willenborg, SAP AG*

Using the right software to support reporting within an enterprise is a great challenge. Many earlier software conflicts have now been reconciled, through the use of modern technology. Consequently, this technology helps to structure the exchange of information, more extensively and more efficiently, both within an enterprise and across organizations.

- [Reports and their Users](#)

In the past, generalized user groups were often used as a paradigm to fall back on. However, this distinction was restricting or even misleading and is now unnecessary. This chapter tells you [why](#)...

- [Displaying Reports](#)

With increasing computer capacities and the introduction of new technologies surrounding the Internet, there are now many new possibilities for presenting information. This section describes how to use these possibilities efficiently and how to remove earlier constraints.

- [Reports and their Environment](#)

Reports show their full strength when they are well integrated into the informational landscape, and into operational business transactions. There are various options that can help to improve the overall view, and can optimize work processes. You find out what they are and how to use them in this section.

- [Different Types of Reports](#)

Modern informational requirements place demands on data processing. These demands could not have been met using automated technology in the past. New perspectives on business data, in order to get up-to-date and detailed insights, require you to do away with old paradigms. Where and how different types of reports are merged for modern demands, is dealt with in this section.

- [Reports and their Elements](#)

Various concepts from the reporting area, and the interaction of different elements within it, are dealt with in this section. It also explains how technology and ergonomics influence and benefit from each other.

- [Uniformity and Diversity of Reports and Tools](#)

Many different demands are placed on reporting, and also on the tools used to create and display reports. How can a healthy level of uniformity be maintained, without making the process too complex for the user? Good presentation and modularity, for example, are an important step towards faster and simpler work. More on this [here](#)...

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## Reports and their Users

[Beginners versus Experts](#) | [Management versus Department](#) | [External versus Internal Reports](#) | [Creators versus Users](#) | [General versus Personal Reports](#) | [Customizing versus Personalization versus ...](#)

When software is designed for creating or displaying reports, distinctions are often made, in relation to user groups, which are no longer necessary. On the one hand, this may be because, in practice, these differences have never actually taken shape (for example, is every employee a specialist only in certain areas and a layman in the others?). On the other hand certain divisions of labor, arising only out of necessity, have no available supporting software.

A design that makes unnecessary distinctions, or still supports them, will not simplify the work process, or improve employee satisfaction, enough. The following boundaries, for example, can be removed here:

- [Beginners versus Experts](#)
- [Management versus Department](#)
- [External versus Internal Reports](#)
- [Creator versus User](#)
- [General versus Personal Reports](#)
- [Customizing versus Personalization versus ...](#)

Résumé: With user-friendly tools, the number of employee groups, able to create their own reports, will be considerably increased. In addition, lower-level employees will now no longer have to sacrifice personal choice regarding the appearance and operation of reports. The technological prerequisites for these changes already exist.

### Beginners versus Experts

#### Beginners

Many users work with information contained in reports, but do not want to go to the expense of learning how to operate reporting tools or have lengthy training. Nevertheless they want to have reports that are geared towards their particular function. Due to bottlenecks in the IT departments of many enterprises, the required experts can often not provide the necessary level of service. Hence, whenever possible, users want to create reports themselves, or at least be able to adapt them to their needs. This requires a tool that is easy to operate, intuitive and does not require the user to have a lengthy period of training.

This group of users makes little use of the options for interaction within the completed report itself. Many of these users spend only a small proportion of their working time dealing with reports. Therefore, users do not want to be offered too many confusing functions, but rather only those functions that they will really use.

#### Experts

On the other hand, more demands are being made on reports that are tailored optimally towards the end-user, within the context of extended display options on the screen and on paper, as well as interaction options. With the number of options available, it is unavoidable that a tool offering all the options for creating reports is fairly complicated. Even if this is evened out a little through an ergonomic tool design, the training period would still be longer than for a tool offering fewer options.

As well as experts who create reports for end-users who are beginners, there are also experts who create reports for themselves, or who navigate intensively in their reports and who require and use a great number of functions. For these users, reports or reporting tools are fundamental to their work.

### Blurring the Boundaries

There are also users, who work with reports infrequently but intensively. They do not work with reports often enough to be able to learn how to use a tool comprehensively. Even so, they want to use a large proportion of the available functions. It is especially important for these users that the reporting tool is intuitive. The simplest - but certainly not the best - method here, is the option of switching between different modes (for example 'Beginner' and 'Expert'). The beginner's functions can easily be made available, and advanced functions can be activated when required. In the end, even experts have a certain supply of functions that they need to use often and do not use all of the implemented options.

However, creators of reports must also be able to design the report, so that the end users are only offered those functions that they need. The functions have to be offered in such a way that they are intuitive and appropriate.

Example: For the sake of simplicity, you can restrict the quantity of data that can be selected, by using a drop-down listbox. For a large value selection, however, this method is not suitable and must be replaced with more adequate dialog boxes. To be more precise, users have to consider a calendar overview for dates, a list for places, and an additional graphic or table for other values.

Finally, note that user observations have shown that the classical division into "Power User" and "Consumer" does not exist. Firstly, even amongst "Power Users", the range of functions actually used varies considerably. Secondly, an employee who you would classify as a "Power User" for certain reports, would usually be a "Consumer" in other areas of their work.

### What does this mean?

If you abandon with the idea of overall categories, such as expert and beginner (and if report creation tool allows you to do this), reports can be tailored more directly to the needs and the know-how of the actual user. The users will, therefore, be supported better with their work.

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## Management versus Department

### Management

Managers often do not have the time to have (and often, depending on age group, nor the interest in) software training. They demand a higher quality of data presentation, regarding both the clarity of the information presented and also the visual appearance. In many enterprises today, the consequence is that employees still use up a lot of their time preparing management information manually in a more responsive and specially tailored way.

### Department

Employees within a department can usually not place such high demands on data preparation. The presentation of their data is, above all, purpose-oriented and usually depends only on the options in the report preparation program.

### Blurring the Boundaries

For managers, manual data preparation, first of all, costs them valuable employee working time, secondly, delays the completion time of the report, and thirdly, prevents the manager from calling up corresponding additional information for the data. Hence, more and more managers have learned to appreciate the benefits of simply calling up well-prepared data directly from the system and from there, be able to branch to further information. If this is made easier by the system and also, if the data display satisfies the higher requirements, managers can make their decisions more quickly and more soundly. At the same time, the workload of

their closest assistants will clearly be lightened.

### What does this mean?

Reports for managers can - with less work for the personnel assisting them - provide the information they want, faster. Lower-level employees, through better reports, are subjectively revalued and work more efficiently. Both parties have increased job satisfaction.

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## External versus internal Reports

### External Reports

Reports that are used not only within the firm, but also outside - whether by customers or business partners - are a prestige object for the organization. Hence, the outward appearance of the report is even more important than for internal reports for senior management. In addition, it is also important that the report represent the firm, through an integrated look and feel. This means that tools for creating reports have to support and facilitate report creation in corporate design.

The modules and templates (described under [From the Data to the Report](#)) that can be used when you create reports, are useful aids in this area. It is beneficial when you can create reports in corporate design just as easily (or even more easily) as in other designs. However, when communicating with authorities, the boundaries within which the layout can vary, are set much closer together (see: [Layout versus Flexibility](#)). In this case, publicity for the firm is of little importance.

### Internal Reports

For reports that are only used within in a firm, greater freedom is allowed with design. It is in this area of reporting that the personal preferences of employees can play their biggest important role. In a society where the unique needs of individuals gain more and more significance, the topic of 'personalization' is particularly growing in importance (see: [General versus Personal Reports](#) as well as [Customizing versus Personalization](#) versus...)

### Blurring the Boundaries

However, it would be wrong to conclude from this that reports used externally are always standardized and internal reports are mostly individual. Firstly, even a corporate design still gives you the opportunity to play with the format of report, and secondly, within many companies there is also the requirement for even internal reports to meet certain standards. One reason for this is because reports are usually used by more than one group. Also, a standard visual design promotes employee identification with the firm.

Since users often choose the path involving the least amount of work, a tool for creating reports has to offer the use of a standard organizational design (where deviations from it are possible but causes with additional work).

### What does this mean?

Reports that have a certain standard design are more easily exchangeable between colleagues and more easily accessible outside the firm.

## Creators versus Users

### Creator

In the days before electronic data processing, people other than the report users frequently created reports. This was time consuming, manual work that managers, for example, did not have time for.

The first electronically processed reports were programmed reports that were created by a software house, a consultancy firm, or in-house developers. Specialist employees were responsible for this. Their work was made easier when the first generic tools came onto the market. Using these tools, these specialists could create extensive reports without programming. However, these were generally so complicated to use that a specialist was again required in this area.

In addition, the reports did not have the visual appearance to begin with that was required by executive levels or for communication with the customer. In this case, electronically processed reports, therefore, had to be revised manually, or in extreme cases, completely recreated by hand.

## User

For the report user, all of this is generally too complicated and time-consuming. The user prefers to pass on the work to specialists and then use only the finished, fully created report. But this leads to several problems: Firstly, the specialists - often IT specialists - are over-stretched in many organizations. This is because, in many cases - particularly in the introductory phase of the software - the planned allocation of resources for creating the report is not sufficient. Secondly, while IT specialists understand their own business area, they do not necessarily have such a full understanding of the business transactions that are supported and analyzed by the reports that they create.

Thirdly, transferring work in this way requires additional communication that can sometimes lead to misunderstandings and take up extra time. In particular, ad-hoc analyses are much more difficult in this situation.

## Blurring the Boundaries

This has led to a situation in which young employees in particular increasingly want to create reports themselves, whenever possible. However, they do not want to have extensive training to teach them how to use a complicated tool, nor do they want to carry out all the detailed configurations themselves. An intuitive (but nevertheless, powerful) tool is a great help, particularly for employees who rarely, but intensively, create reports and analyze company data with them (see [Beginners versus Experts](#)).

Moreover, such employees like to fall back on suitable, ready-made modules and templates, which simplify the process of creating reports, hide complicated creation steps and thus, accelerate the work process. These can be created by specialists (for example, from the IT department) and tailored for the user group. The workload for this is significantly less than for creating complete reports, as the number of modules and templates that have to be staged is less than the number of reports that have to be created.

## What does this mean?

Users of reports are considerably more contented when they can work with the best possible reports for them and do not have to be satisfied with half-hearted solutions. Moreover, they can act with more flexibility and do not always have to wait for the specialists' help. Finally, specialists are sometimes thin on the ground and expensive, making it advantageous if they are not required so often.

## General versus Personal Reports

### General Reports

One of the advantages of electronic data processing is that many users from different places can easily access the same data from centrally created reports and other documents. These reports are particularly more accessible through the use of the

Internet and mobile devices.

## Personal Reports

However, if every report is accessible to every employee, individual employees can lose sight of the required information in the flood of reports. A large proportion of all reports is irrelevant for most employees. Also, if each user is allowed to tailor individual reports to their own needs, the number of different reports increases quite substantially.

Therefore, it is necessary to also have reports that can only be accessed by one specific user. In this way, individual employees can create a worklist of reports that they require that can be accessed quickly (as can generally available reports). In the same way, the process of creating reports has to be supported and accelerated through the use of personal modules and templates.

To a certain extent, this has already been possible for a long time via local repositories on the PCs of other employees. But this is, strictly taken, only an allocation of documentation to PCs and not of documentation to employees. As well as restricted accessibility, this solution has some additional disadvantages, as the following section explains.

## Blurring the Boundaries

In practice, the basic distinction between general and personal reports is much too vague. Often, several employees have to fulfill similar tasks and therefore need to use similar, or the same reports, which can, in turn, be of no interest for their colleagues. In addition, every employee is part of a particular department and has to be able to access shared documents used internally within that department.

Therefore, the question of which reports or modules have to be visible and usable for which users, cannot just be addressed using a storage structure. Apart from manual selection, access has to be determined, rather, by the role of the user within the organization as well as its department and project affiliation. Additional aids, such as an efficient search function and an automatic notification service, complete the range that is necessary to be able to access reports quickly, efficiently and clearly. (See also: [Search Help versus Report](#) as well as [Online versus Offline](#)).

## What does this mean?

Users can work more quickly, if they have well-organized support functions that they need for their tasks which can be found quickly. This is also valid for reporting.

## Customizing versus Personalization versus...

### Customizing

Every organization is different. Therefore, the design requirements of the reports, as well as employee authorization demands, are also different. This means that - as with all other programs - it is important that reports can be adjusted (without any programming expense). As a rule, this is done centrally, partly throughout the organization and partly at department level. This ensures a certain level of uniformity. A large amount of work can be removed for companies in this area, as the program is delivered complete with meaningful defaults. These can either be different software delivery versions or else, (similar to the desktop themes of Microsoft Windows) whole sets of settings that can be changed as a package.

### Personalization

On the other hand, it would be too much of a job for employees who carry out central customizing to make individual adjustments for every single colleague. Therefore, in many areas each employee has to be able to make their own individual settings, individually. In reporting, this concerns, for example- depending on authorization -the configuration of the tool for creating reports or the selection of reports, templates and parameter assignment, as well as the organization of these in favorites, worklists and

so on.

### **Another Alternative**

However, this personalization has a crucial disadvantage: Most users do not use it. There are some users who place a lot of emphasis on being able to adapt their working environment to their own requirements in the best possible way. But at least as many users again do not take the trouble to do this and then, work more inefficiently accordingly. Hence, it is necessary to structure this personalization as simply as possible, so that even users in the second group see its benefits.

With suitable pre-customizing, you can make the personalization settings in such a way that they support user tasks in the best way possible. Here, it is important to have an efficient role concept that suitably brings together users with the same or similar tasks.

On the other hand, many software systems - not only in the area of 'reporting' - have now changed so that they are able to register the settings as they are made by employees during their everyday work. In this way, the program is gradually personalized (without the user explicitly having to do anything) and employee efficiency is increased. However, this procedure cannot be used for all settings.

### **Result**

A good program uses all four methods: Good pre-configuration, central customizing support, enabling of explicit personalization, and a good "memory for settings" for personalization.

### **What does this mean?**

Just as in craft work, where a good tool that is adapted to the tasks at hand in the best possible way can simplify and speed up work enormously, a reporting tool that is optimally tailored to the tasks of the user, can also increase work efficiency substantially.

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## Displaying Reports

[Table versus Diagram](#) | [Layout versus Flexibility](#) | [Screen versus Paper](#) | [Online versus Offline](#)

Nowadays, there are many possible ways of displaying data and to extracting information from this data. However, different presentation options had (and still have in parts) their advantages and disadvantages:

- [Table versus Diagram](#)
- [Layout versus Flexibility](#)
- [Screen versus Paper](#)
- [Online versus Offline](#)

Résumé: Tables and diagrams complement each other well. Flexibility requirements impose fewer restrictions on layout in program design, than was generally presumed until now. In the future, reports displayed online, on the screen, will continue to replace (but not completely) offline displays and printed, paper reports.

### Table versus Diagram

#### Table

Tables offer an ideal opportunity for you to view detailed information in a compact and structured form. A table is often the display method of choice, particularly when the report deals with exact values of individual key figures, or the individual contents of an attribute that is not summable.

When you have a large amount of data, it is advisable to point the user towards essential information, through grouping and emphasizing certain data, to give a clearer overview.

#### Diagram

However, it is easy to lose track of relevant information when dealing with a large amount of data. Even when you can simplify orientation by using automatic emphases and filters, a picture can often say more than a thousand words. Relationships, trends and summary information are usually much easier to grasp - even at a glance - if they are presented in the form of a diagram.

There are many factors to take into consideration that can favor or hinder how well users register information. Color, size, order, numbering, legends and much more, all have an effect, not only on how quickly information can be absorbed, but also on how many errors are made while doing this. Suitable default values and tips can be helpful here for workers less familiar with the psychology of perception (and this usually concerns report creators).

#### Blurring the Boundaries

Nevertheless, with only one of the above and not the other, you often get only half the value. For example, a survey amongst managers has shown that they would prefer to have their data presented in parallel in both a diagram and a table. In this way they can quickly obtain an overview, with the help of the diagram, of where distinctive features are, and then, with the help of the table, they can obtain more concrete information. In this case a table is sometimes used as a kind of extended legend.

These combinations are being used more and more often: For example, in a bar chart; if the numeric value appears as a number at the end of the bar in an unobtrusive way, the reader does not have to estimate this value and does not have to check the scale or in the table. Moreover, diagrams in which values can be differentiated according to many criteria are often better displayed not as 3D graphics, but as tables in which each cell contains a graphic.

### **What does this mean?**

Supporting the visual design of the data display from an ergonomic standpoint, simplifies (or makes possible) the job of report creators, who have little knowledge of ergonomics, to design reports so that users can absorb information from the reports faster and with fewer errors. The interaction of diagrams with tables is already simplifying the registration of relevant information.

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## **Layout versus Flexibility**

### **Layout**

Many reports, particularly printed ones of course, have a fixed format, such as a form that you cannot, or can hardly, change. These can - with somewhat more work if necessary - be created to suit their planned purpose and used again and again. To some extent, legal standards, other external conventions or internal guidelines set detailed formatting requirements.

Here, you can define specific formats which can differ even from cell to cell. You can also determine the exact interaction of several reports in one layout here. This can simplify the registration and handling of the displayed data to a great extent. A good tool for creating reports supports the user, by making all required formatting available.

### **Flexibility**

For analytical purposes, however, quite different information is required from the reports and therefore, data is examined from quite different viewpoints. Consequently, the number of table lines and columns that are created or the size of the diagram displayed, changes dynamically and sometimes considerably. In addition, users often want to be able to display more tables or diagrams dynamically with additional information. These could contain, for example, further details, or summarized background information.

This has much less to do with the detailed, optimized layout of the individual view, than with presenting the functions for changing the view (which would disrupt the display of a report with fixed layout) so that they are easily and intuitively accessible.

### **Blurring the Boundaries**

However, users often want to change the displayed data segment, even in reports with more complicated layouts, if necessary. This mostly concerns changes to the sorting or filter (and if necessary, also to highlighting), which do not change the actual layout. Such functions, therefore, need to be offered as an option (as they are not always necessary) for reports with optimized layouts, in such a way that the visual presentation of business data is obstructed as little as possible.

Conversely it has been noted that visual appearance is relevant in facilitating quick and easy data entry, even for flexible analysis reports. Therefore, such formatting options also have to be offered here, but must not conflict with the navigation options. Unlike in the tool for creating reports with special layouts, the formatting options do not need to be in the foreground, because they will generally not be used very often and have less significance.

### **What does this mean?**

Layouts with task-specific functions can also be used increasingly in place of generic layouts even in flexible reports. This makes the reports easier to read and increases user satisfaction through a more attractive appearance.

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## Screen versus Paper

### Screen

For a long time, data was only displayed as ASCII lists on the screen. Earlier screens did not support other formats. However, even at this time, screens had an advantage over paper. Data was always up-to-date and the data view could be changed interactively (so long as the tool for displaying reports allowed for this).

However, the user can, as a rule, only see a small section of the data on a screen, than can be displayed on several sheets of paper. This disadvantage can be (sometimes even more than) evened out, however, with suitable navigation options and even the possibility of changing the data view interactively provides a large advantage over paper reports.

### Paper

Unlike on the screen, where you can scroll vertically and, if necessary, horizontally and consequently are not limited to a fixed output, sheets of paper have a fixed size. Themes, such as pages breaks, carrying text over, headers and footers and similar weights, have to be considered in this area - all questions, which (perhaps apart from headers) play a less important role on the screen.

The transition from purely character-orientated output to the inclusion of more graphics took place much earlier on paper than on the screen. In cases where the printer itself did not yet support graphical output, the data could be printed onto pre-printed paper. Consequently, the visual appearance of reports has been significant for a long time - especially since reports distributed on paper amongst customers and business partners as well as internally, are also a kind of prestige object for the organization (see also: [External versus internal Reports](#)).

Until central data can be accessed from everywhere, paper also has the advantage that it can offer information "offline" and be transported economically. Also, many people prefer to read information on paper. It is also possible to get a better overview on paper when the report deals with large amounts of data. Until now, it has also been easier to make comments on paper than on the screen, where this is still not generally supported.

Finally, many firms still archive reporting data in the form of printed reports. Many programs still do not allow you to save snapshots, but only allow you to save report templates that are re-filled with data when called up.

### Blurring the Boundaries

However, since the introduction of graphical interfaces (at the very latest), formatting and graphical items have also found their way into screen display. And not least since the advent of electronic data exchange via e-mail or Web, these can now be exchanged with customers and business partners - without always having to print them out first.

Therefore, the same demands, as on printed, paper reports, now apply to visual formatting on the screen. Pure ASCII lists in fixed font format are no longer state-of-the-art, but have given way to interactive tables and diagrams that allow similar formatting options, such as graphical presentation programs.

Only the limitation of paper size does not apply to on-screen display (keyword: Scroll). Although many people find horizontal scrolling annoying. They would much rather have a flexible layout that fits the width of the display window, on the one hand, to make full use of the space and, on the other hand, to avoid horizontal scrolling.

However, there is still a demand for WYSIWYG, which in this case means that the on-screen display has to deviate as little as possible from the printed version. Naturally, this competes with adapting the output to fit the screen width, so that the creator of the layout has to decide which screen format is more suitable for each specific case.

On-screen reporting is taking over more and more, even in the remaining areas that still use printed reports: Through the Internet and mobile devices, centrally created information is available in more and more places, so that the demand for offline work is falling. Sharper, flicker-free and larger screens mean that the user can read without fatigue, and with suitable navigation aids, the user can get a good overview of large quantities of data, more and more similar to the paper overview. With the market maturity of electronic papers, the factors of 'weight' and 'space' will be less important when reports are transported.

Today, reports are often being exchanged and sent, not by post, but by e-mail. Reports that are distribute among, for example, customers and partners, are becoming unnecessary, since the same reports are being published on Web sites, and can therefore be accessed by several users at the same time. It is important that the user can add comments (see also: [Structured versus Unstructured](#)), to remove the remaining advantage of paper reports over screen reports.

As with archiving other documents, the archiving of reports is gradually switching to from paper reports to electronic data carriers. This provides the additional option (which is becoming more and more important) of displaying a combination of current data with archived data and carrying out automatic comparisons. In this way you can, for example, create long-term, but no less detailed, trend analyses.

### **What does this mean?**

By combining the advantages of the printed format with on-screen display, you save paper and also have more reporting flexibility.

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## **Online versus Offline**

### **Online**

The possibility of accessing reports online has the advantage that the data, which is the basis of the reports, does not all have to be stored on the local computer. Depending upon the architecture of the display program (thin client or fat client), the program logic does not need to be installed on the local computer either. This saves installation time, memory space and computer performance.

Depending on the application area, however, it is more important that you have access to (more) up-to-date data. Automatic notification can be easily provided (apart from short online connections for sending a message by phone). However, the disadvantage is that you have to be connected to the main computer, which is not always possible, for example, when you are travelling, or sometimes working from home.

### **Offline**

The above problem is eliminated if offline reports are available. The price of this is - along with the possible need to increase the capacity of the computer -less up-to-date data, a price that can not always be overcome. Depending on how much application logic takes place on the local computer, fewer processing functions are available for offline reports. The alternative, working with a thin client in the case of online, and working with a fat client offline, is perhaps not advisable due to double development and maintenance expense (with the danger that both versions end up with totally different user interfaces).

## **Blurring the Boundaries**

Not least thanks to the Internet and mobile devices it is, however, possible to access data online from more and more locations. This has even gone so far as office product manufacturers orienting their strategy towards running their programs mainly on the Internet. As a result the need for offline work is falling - especially since the cost of online connection is falling and access is becoming more widespread.

However, the new challenge here (at least until the data transfer via the Internet is faster) is to decide which functions can be delivered to the front end, and which need to have communication with the back end. Functions delivered to the front end run more quickly, but also need more application logic. Also, if communication with the back end is required, the range of data to be transferred has to be minimized.

### **What does this mean?**

People in more and more places can stop using offline reports and can use the advantages of online reporting without having to install extensive software on the local computer

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## Reports and their Environment

[Stand-Alone versus Embedding](#) | [Information versus Operation](#) | [Batch versus Online](#) | [Mailing versus Subscription](#)

Reports are always incorporated in some way into the working environment. The following examines which dependencies should be taken into account here, but also the possibilities presented.

- [Stand-Alone versus Embedding](#)
- [Information versus Operation](#)
- [Batch versus Online](#)
- [Mailing versus Subscription](#)

Résumé: Through the integration of reports in the informational landscape into operational business and into general communication paths, in combination with automated analyses, many work processes will clearly be optimized.

### Stand-Alone versus Embedding

#### Stand-Alone

For a long time, on screen reporting meant that only one report was displayed at a time. In the best cases this consisted of several parts (for example, diagrams and tables). Since many reports also have to give a good overview of a large amount of data, a stand-alone report is still often chosen as the best method of displaying reports.

#### Embedding

However, portfolios of reports are often created from printouts. These portfolios consist of various reports with related contents. Here, the different reports are not always distributed on separate pages. A more substantial overview is actually often given, as a result of the fact that you can view data from different reports at a glance.

This advantage has also found its way into reports on-screen. In particular, the fact that it is considerably easier to bring together information from different sources on the Web and display it together, has prepared the way for 'cockpits' and 'newspapers'. Since there is less space remaining here for individual reports, the author has to, of course, concentrate on only essential information for these pages.

#### Blurring the Boundaries

Often this excerpt of data is, however, does not provide the reader with enough information. Further data is required, which describes the displayed information more clearly and clarifies questions that arise from assessing the overview. Therefore, it offers to supply, from reports that are relatively less interactive in the 'cockpit', the jump to stand-alone reports with extended navigation options. The reports can, when necessary, also display larger amounts of data and can, in turn branch out into other reports.

Therefore, another aspect of embedding, not yet mentioned above, is addressed: Stand-alone reports are also linked, thus making it possible to jump to and from "portals", "cockpits", other reports and even processing transactions (see: [Information versus Operation](#)). Even for determining (and removing) the causes of distinctive features, a quicker link to additional sources of

information is a great help, whether this supplies a larger overview, reveals further details, or allows you to access other data from the current context.

If - as addressed in [From Data to the Report](#) and in [Search Help versus Report](#) - a report consists of several components that are perhaps reports themselves, the distinction between a report from components and a composition of individual reports is pointless, at least from the user's point of view and if necessary therefore, also has to be hidden by the tools.

### **What does this mean?**

A meaningful and clear composition of data from different sources allows users to grasp important information and its causes, at a glance, information for which they would otherwise have to navigate through various programs and screens. This helps users to absorb information more quickly and relieves the strain on their short-term memory.

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## **Information versus Operation**

### **Information**

In earlier products the distinction between operative and more informative transactions was usually fairly clear. Reports either delivered an overview of a (possibly) large amount of data or provided more flexible methods of analysis and more alternative views of the data than operative transactions.

### **Operation**

In contrast to this, operative transactions worked mainly on single objects and often delivered only one view of the data, namely one that optimized data entry and checking.

### **Blurring the Boundaries**

However, there have also been common features here for a long time: Firstly, access to a processing task is usually information-driven. A good working environment supports this, by facilitating the jump directly, from the reports that deliver information, to processing transactions. In this way, the report is a kind of portal.

It is also especially important with planning transactions, that you can examine the data directly, during processing or simulation, from different perspectives. At the very least it must be possible to navigate quickly between the processing view and various analytical views. Even complex evaluations are required in part, before the data (if necessary, even irreversibly) is saved permanently in the database.

And thirdly, in more and more areas, the worklist is important, that is, a number of objects, selected beforehand that have to be worked on. Again, we can differentiate between two cases: The worklist can feed a kind of workbench, from which different operations are executed according to each object. Users have such standardized central access into a defined working environment, from within which individual activities can be carried out (because they are information-driven) more quickly and more purposefully.

On the other hand, the worklist can also be the basis for mass activities. One activity (or, if necessary, several activities) is executed on all the objects in the worklist, in this case. Using the end results, the activity can then be produced again in another report, which, if necessary, releases a further activity. In this way a circle is formed from which you can construct a complex workflow.

### **What does this mean?**

By linking the provision of information with operational business, you can automate specific mass activities and tackle other activities more purposefully. This takes the load off employees and accelerates the work procedures that are still carried out by hand.

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## Batch versus Online

### Batch

At the start of the computer age, reports could only be printed out. Later, the screen display on character-based screens was added. This display was of limited size because of the smaller screen segment - especially since the display was usually static. Large quantities of data can still usually only be selected in batches; and a large printout gives a better overview of this data than the screen.

### Online

Conversely, the on-screen display offers more flexibility: You don't have to wait for the printout from the printer, you can try out views without creating large mountains of paper and in addition, you can jump around between reports and transactions (see also [Stand-Alone versus Embedding](#)). Creating ad-hoc reports with simple tools is only really of interest since the introduction of tools, which create and execute reports online.

## Blurring the Boundaries

Often, users want to select and process larger quantities of data using online reports. Nevertheless, they do not want to have to wait a long time for this. In many cases here, they prefer to calculate reports in batches and then display them online. It is not always the case that users have scheduled an overnight report. More often, users need to be able to create ad-hoc reports in the background, while continuing to work during formatting. The report can then be called up a short time after the end of the batch job (for example, following an automatic notification).

A further - probably even more important - application field, in which batch and online reports work together, is the alarm function: Reports are executed in the background and the data is checked against pre-defined exception conditions. Exceptions that occur produce a message or start a workflow via, among other things, the report displayed online, in which the exception occurred.

Even such scenarios, which can relieve employees of a lot of time-consuming work, in that they do not always have to check their data, must naturally be easily definable. In practice, this requires such exceptions and regular checks to be specified not by IT personnel, but by area specialists. These specialists recognize the exact requirements of their area and are able to communicate these to the system. This speeds up the creation process and relieves the strain on IT personnel. However, it must still be ensured that the system is not overloaded with batch jobs.

### What does this mean?

Combining batch data selection with online reporting accelerates the speed of work, in that the user does not have to wait so long for the report to be displayed. In addition, the user is relieved of time-consuming routine tasks (for example checking and monitoring certain data and transactions) using alarm functions.

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## Mailing versus Subscription

### Mailing

Many reports are not only used by employees, but by other people as well. Therefore, users must be able to exchange them, and, if possible, not only on paper, but also electronically. This includes not only the need to send out the finished report with its data, but also, to exchange report templates and modules amongst one another. With completed reports (and in part, report templates as well) the user often wants to add specific comments before they are sent out (see: [Structured versus Unstructured](#)).

## Subscription

On the other hand, there are also many situations, in which information has to be accessible to a group of readers, whose range is not known to the author. It therefore has to be possible to make the report or the report template accessible to a group of potential interested readers. These potential readers can then subscribe to the report or add it to their personal favorites (key word: 'publish and subscribe'). It is especially helpful, if an automatic notification is sent to the user as soon as the report is changed. The alarm function (see also: [Batch versus Online](#)) can also be useful in this situation.

## Blurring the Boundaries

However, there are also methods of sharing information that lie between these two alternatives. You can send a document out, not only to a specific addressee, but also, for example, to distribution lists. These can either be created by the sender, or be generally accessible, so that interested parties can register themselves on the lists. In addition, in order to reduce the data transfer and so that the user is only dealing with a central document, only links to the document are often sent and not the document itself.

On the other hand, it is often the case that users do not only subscribe to single documents, but whole folders. In this case, the user does not only have access to explicitly selected documents, rather all documents created in these folders (if applicable via a link). If the user is now automatically informed of changes, the effect is similar to that described in the previous paragraph for sending a link.

All of these possibilities for exchanging information, which we have long since taken for granted with unstructured documents (for example, text documents), are, of course, just as valid for reports and report templates (see also: [Structured versus Unstructured](#)).

## What does this mean?

The possibility of exchanging and distributing structured information, as well as unstructured information using different, complementary channels, furthers communication and therefore, co-operation. Particularly in large organizations where tasks, which can no longer be taken on by one person, are distributed among several employees, it is an indispensable aid for coordinating sub-tasks and avoiding massive increases in duplicated work.

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**Source:** [Reconciling Conflicts in Reporting](#)

## Different Types of Reports

[Standard versus Ad-hoc](#) | [Condensed versus Detailed](#) | [Key Figures versus Master Data](#) | [Replication in the Data Warehouse versus Direct Data Access](#)

The conventional method of allocating reporting tools according to responsibility for different types of reports, has proved to be a hindrance time and time again. This section will examine why this is the case and how the problems can be tackled:

- [Standard versus Ad-hoc](#)
- [Condensed versus Detailed](#)
- [Key Figures versus Master Data](#)
- [Replication in the Data Warehouse versus Direct Access](#)

Résumé: If you facilitate a smooth transition from ad-hoc reporting to reusable reports, the construction of a reporting landscape will be considerably easier. If top-down and bottom-up approaches are interpreted as two metaphors for navigation around the same data, it is not necessary to divide up reports into key figure reports and master data reports. A good Data Warehouse also makes real-time reporting possible.

### Standard versus Ad-hoc

#### Standard

Many reports are executed not once, but many times. Therefore, they should not have to be recreated each time. Instead, it should be possible to re-access templates and fill them automatically with the new data. Whereas earlier, at the time of 3270 screens and matrix printers, there was relatively little freedom of structure, today, in the age of graphical user interfaces and color and laser printers, considerably higher demands are made. These, of course, increase the amount time spent on creating reports.

The more structuring options that reporting tools make available, the less the user will have to alter completed reports by hand. The days when pure ASCII output had to be painstakingly processed by hand in a text or graphic editor should definitely remain in the past.

#### Ad-hoc

However, if users would like a general view of certain facts for which there no pre-defined report exists, they need a tool that enables them to quickly compile this information themselves. It is important that they can quickly find the data they need. They need a tool that provides a business-operations view of the relevant data fields - characteristics, indicators and other attributes - and their links. This tool must be clear, and must help to find the fields needed by filtering and sorting.

If users have gathered together the data fields they want, they will then want to put them into a suitable layout geared towards their tasks. The requirements in such cases are normally less extensive than with standard reports, since the main requirement is not visual appearance but that they are functional - users want to create their reports quickly and be able to process data logically in ways that are best suited to their needs.

### Blurring the Boundaries

However, ad-hoc reports are often called up not once, but several times. Users should not have to choose between two different options - they should be able to save an ad-hoc report and rework the visual image if necessary. Since, in many companies, IT personnel no longer have sufficient capacity to create all of the required reports, it is an advantage if end users can create standard reports themselves and leave only the fine-tuning to the IT specialists.

On the other hand, the IT department or software house that has developed the tools for creating reports can deliver special modules and templates (with the necessary powerful functions) that make the creation of ad-hoc reports considerably easier and quicker, meaning that report creators need not always start from scratch. In many cases, creating a report can also be helped if report templates exist that can be adjusted to meet current requirements with suitable parameters when executing the report.

### What does this mean?

There are a growing number of options available for creating ad-hoc reports are increasing and the transition to reusable reports is becoming smoother. The desired result is being obtained more quickly and workload is being reduced in IT departments.

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## Condensed versus Detailed

### Condensed

In the case of reports with condensed data the main focus is on data that can be aggregated. Usually the top-down method is used, that is, users start at a relatively high level of condensing and then display successively more details for important data (zoom in or drilldown). Experts also change (navigate) between different views (slice and dice).

### Detailed

The other approach is the bottom-up approach. This is used mostly for reports that either contain hardly any data fields that can be aggregated, or for those in which the main focus from the start is on a detailed and complete overview of all selected data. To get an overview of the structure, particularly with large quantities of data, grouping and highlighting with color and font attributes are used.

### Blurring the Boundaries

It is becoming more and more evident that the traditional drilldown method is not always the method of choice. Especially in cases where users want an overview of details from several areas, it is more sensible to use a display hierarchy in which the individual branches can be expanded and compressed. This corresponds to presentation in a hierarchical detailed overview in which only the upper nodes are displayed in the initial screen.

On the other hand, in the case of detailed overviews users also want to be able to aggregate the condensed data according to the hierarchy or group level, so that even here, the boundaries for condensed reports are blurred. It is not only the classic key figures (that is, numerical values: Quantities, amounts, and connected values) that can be aggregated here (see also: [Statistics versus master data](#)).

Due to the fact that many users do not work exclusively with one particular type of report, it is important to provide user interfaces via which comparable operations can be carried out in the same way. Whether these demands are best met with one tool or with two similar tools is a question that is often discussed, and there are many arguments for and against both options (see also: [One tool versus several tools](#)).

### What does this mean?

The standardization of the two paradigms that originally seemed to be quite different, means that users do not have to decide

which tool to use for processing data. They can decide there and then which tools to use for navigating through data, and mixed views are possible.

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## Key Figures versus Master Data

### Key Figures

Traditionally, when reporting about key figures, there is a strong distinction between key figures and characteristics. Key figures are numerical and can usually be condensed with simple formulas (but sometimes only with very complex formulas, or even not at all). In contrast to this, characteristics are normally not numerical. Instead, they give criteria on the basis of which key figures can be gathered together. Key figures are determined clearly by the combination of characteristics. In other words, a combination of characteristics provides the key by which the data record can be identified.

There is a distinction here between Analyses (that are, for example, distributed in controlling, and in which key figures are analyzed from completely different angles and therefore show a higher amount of dynamics in the layout) and more Static Reports (such as those that are needed for financial accounting) (see also: [Flexibility versus Layout](#)).

### Master Data

Traditionally, when reporting about master data, there is no separation of characteristics and key figures. Usually people simply talk about Attributes that can show various properties. In addition to the question of whether the reports can be condensed or not, it is also important to consider other questions, such as, how often the values can be used.

There are also two extremes in this case: Very flexible Analysis reports or Ad-hoc Analyses that are used often, for example, in Human Resources, or Fixed Overviews, in which the format is more similar to that of traditional reports.

### Blurring the Boundaries

For a long time, tools for creating statistical and master data reports were clearly distinct from one another, not only at SAP. This was partly due to the different demands caused by different program architectures, and partly due to the fact that other types of report are also significant in different application areas.

In practice it is becoming clear that other factors are needed to explain key figures. These provide not only more detail in the case of more complex key figures, by breaking down the process of calculating reports, but also additional attributes of the characteristics involved.

However, attributes in master data reports are often numerical, that is, key figures. Often users wish to condense these key figures according to a particular point of view on an ad-hoc basis. In practice this is the case especially with hierarchies or when forming groups.

In addition, sometimes-large amounts of attributes, which are not numerical, are condensable. In the case of dates and times, an earliest possible/latest possible date or time (for example earliest start, latest end) is often helpful. Moreover, counters for the number of entries or for the different attribute values within these entries are important. Together with other key figures they can deliver important information.

Due to considerable merging of departments that also need process-orientated general reporting, the sharp distinction between key figure and master data reports is becoming more of a hindrance. It therefore has to be removed.

### What does this mean?

Users who want to create reports that can combine key figures and other attributes, finally have a tool that is suitable. Regardless of application, they can easily swap between key figure-orientated and master data-orientated views or methods of navigation, without having to change to another tool.

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## Replication in the Data Warehouse versus Direct Access

### Replication in the Data Warehouse

A data warehouse has clear advantages in reporting: Data can be accessed more quickly because it has been stored in the way best suited to analysis. Not only are the system parameters for displaying data optimized, but suitable indexes, aggregates and joins are also stored in the database. Historical data can also be accessed and consistent analyses using several operative systems and even external data (for example via the Web) are possible.

This advantage of the data warehouse is won at great cost, in that additional systems (with additional administrative expense) and additional memory are needed, and that the data is, for performance reasons, usually not as up-to-date as in the operative system.

### Direct Access

In the case of large amounts of detailed data, the decision has to be made as to whether the data has to be replicated in its entirety in the data warehouse, or simply in condensed form. If users have to create up-to-date reports, they can still access the data in the operative system, since usually data is replicated in the data warehouse only at certain intervals.

Of course, it is preferable for not all of the convenience of the data warehouse to be lost, for example, neither the general data model, nor the operating interfaces or display options. Therefore it is possible to allow direct access to operative data using the data warehouse tools, rather than offering a further reporting tool in every operative system.

This has the following advantages: Firstly it ensures that user interfaces are identical (or nearly identical). Secondly, a uniform data model can be accessed. Thirdly, operational business is not so burdened by reporting. Fourthly, as a rule, reporting programs can be replaced more frequently by new, improved versions than operative systems can. In this case, direct access is also improved.

### Blurring the Boundaries

A fluid transition is created to a seamless combination of data from the data warehouse and data from operational systems. If historical data has to be combined and compared optimally and across systems with real-time data, one central reporting tool has to be used, and not separate tools that are distributed throughout the system. "Combination" does not only mean combining data that is entirely in the data warehouse with data that is entirely in the operative system. More often it is a case of obtaining data from a table in the data warehouse whenever possible and adding the missing current data from the operative system - naturally without the users knowing that the data comes from two different sources.

Only when the efficiency of commercially used computer systems is increased, and the cost of memory space falls, will it be possible to transfer even large amounts of detailed data in real-time to the data warehouse, as is required for higher flexibility. Moving old data to near line storage, which is 10 times cheaper than traditional methods of storing data, but which requires a somewhat longer access time, is one way of saving on memory costs that already exists. However, even in this scenario, the distributed storage of data has to be hidden from users and only regulated in the warehouse administrator.

### What does this mean?

The advantages of general reporting are combined with the advantages of real-time analysis. This allows quick, timely decisions to be made on the basis of comprehensive and consolidated information using a uniform user interface.

## Reports and their Elements

[From Data to Report](#) | [Tools versus Results](#) | [Daten and Metadata](#) | [Search Help versus Report](#) | [Structured versus Unstructured](#) | [Template versus Snapshot](#)

The following section describes - from a somewhat more technical point of view - the elements of a report as well as the reporting environment. It will clarify, that technology cannot be separated from ergonomics, but that the two both restrict and support each other. Several terms will also be defined here.

- [From Data to Report](#)
- [Tools versus Results](#)
- [Data and Metadata](#)
- [Search Help versus Report](#)
- [Structured versus Unstructured](#)
- [Template versus Snapshot](#)

Résumé: The various aids that help to provide information, can be considerably more beneficial if they work closely with one another and share common functions.

### From Data to Report

Many different components influence the creation of a report. It could be said that these define the report:

#### Data Storage

This is where the business data that is to be reported on when it is analyzed is stored. This data needs to be current and quickly accessible (see also: [Warehouse versus Direct Access](#)).

#### Query

The query determines which data is selected from the data storage, and how several data storages, if possible flexibly definable, are linked together. When creating a query users should be supported so that they can find the required data or metadata easily (see also: [Data versus Metadata](#) and [Search Help versus Report](#)).

#### View

The view determines how the data delivered by the query is presented, for example, the criteria according to which it should be condensed, sorted or filtered. The functions available, which should be easy to use and intuitive, decide the extent to which the completed report is geared towards users' tasks, and remove some of their workload.

#### Modules

In order to keep the layout of a report as flexible as possible, many reporting tools include the option displaying a view that is not

a uniform whole, but individual parts of the whole (such as, navigation area, table, graphic and so on), placed separately in the report. As with program interfaces where there are low-level and high-level interfaces, pre-configured module groups also have to be available (and definable) alongside the smallest modules, the biggest of which has to correspond to the whole.

## Visual Design

Formats such as colors, fonts, lines, graphics and bitmaps are decided here. They decisively determine the display and can, among other things, simplify or hinder the recording of data. A good tool for creating reports does not only provide the necessary functions here, but also supports users in choosing ergonomic formats and combinations of formats. Therefore, even users who have not been trained in the psychology of perception can create ergonomic reports.

## Layout

In the layout, the arrangement of the various parts of the report is specified (modules) or, if necessary, expanded with additional graphical elements (for example, logos). Different reports, that can still also be logically interdependent, are often put together in one format. Typical examples are forms, newspapers and cockpits.

## Blurring the Boundaries

These more technical details must be hidden from the user wherever possible. Users specify a report, or to be more precise, a report template (the report itself is created only when the data is read and processed with the template), and are not interested in the various technical elements of it. Transition between the different components and therefore the assignment of technical properties is smooth (see also: Global versus Local Settings). Therefore it has to remain as concealed as possible by a well-designed report creation tool.

## Variable Parameters

The parameters that shape a report are not always specified when the report is created. Frequently, at least some of the parameters have to be set when the report is executed, that is, when the report template is filled with data. This can either be done manually or using, for example, a user-specific pre-defined set of parameter values.

Such parameters can also be supplied with values for authorizations, responsibilities and affiliations to certain units' personnel organization. There is also the option of specifying the parameters through another program or report from which the current report has been called up.

## What does this mean?

Although a tidy program architecture is indispensable in a good report creation tool, these details do not need to burden users. Indeed, they can actually simplify customizing and personalization expense (especially when making changes later) and allow more flexibility.

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## Tools versus Results

When reports are mentioned in connection with SAP applications, it can mean three different things:

- a. The report creation tool, that is, the program with which a report or a report template is created.
- b. The completed report template, which presents the appropriate data whenever it is called up and therefore continues to create new reports.
- c. The reports themselves, the data content of which cannot be altered and which provide a snapshot of data at a particular point in time.

## Tool

The tool with which reports are created is, in the simplest case, comparable to a paint box. In the most complicated case, it is a programming environment. There are also many steps in between these two extremes,. Therefore, it can be sensible to have different tools for different users (see also: [Beginners versus Experts](#) and [One Tool versus Several Tools](#)).

## Result

The result that is created by the tool can be a report template that must be called up online and shows data valid at the time it is called up, or a complete report that displays data that was valid at the time at which the report was created (see also: [Templates versus Snapshots](#)).

## Blurring the Boundaries

Whereas previously, a tool-orientated approach was normally used for calling up reports, the document-orientated approach is most often used today. This is, for example, similar to text documents: They used to be called up by starting the text editor and then loading the document into the editor. These days, users can call up a document directly, at which point the appropriate editing tool is automatically started up. Only when a new document is created that does not have a corresponding existing document that can be used as a template, does the editing tool have to be called up directly.

## What does this mean?

Users no longer have to think about technical categories such as tool, template and report. They can simply decide on a business-orientated level what it is that they want to see: A report that was created earlier, or current data.

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## Data and Metadata

### Data

In this case, data means the business data about which users want to create reports. This can be completely different types of data from completely different sources (for example, financial data, dates, quantities, costs, allocation and other attributes) that have various sorts of connection with each other.

### Metadata

Metadata describes the relationships between sets of data and the properties that the datasets have. This is usually of no interest to the end user during analysis, but plays a fundamental role during the creation and alteration of reports or report templates. It delivers a model of the system's in-built business management that is as consistent as possible. It makes statements about the significance and format of the available business data and about the relationships between datasets.

## Blurring the Boundaries

The larger the business data content about which reports can be created and the more metadata available, the more need there is for a repository offering similar functions to those offered for reporting business data.

On the other hand, classification data, for example, builds a kind of metadata system itself. This is not set out by the database or data warehouse suppliers, but is built up by individual customers. Yet the data field search can be made simpler by appropriate classification of the data.

## What does this mean?

In the administration, data warehouse modeling and report creation, the same powerful tools are used for finding and organizing metadata, as are used in reports on business data. This improves the overview and makes corresponding tasks quicker.

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## Search Help versus Report

### Search Help

When searching, users are interested in a single value or a set of single values that they are going to reuse for a particular purpose. In reporting, these are, for example, reducing the selection, filtering or highlighting. But these sets of hits can also serve as a basis for creating a worklist (see: [Information versus operation](#)) or for running a background job (see: [Online Versus Offline](#)).

### Report

In a report, users want to obtain an overview of a certain quantity of data that they - and certain processes - have limited by using certain criteria. As was mentioned in [Information versus operation](#), this view can serve not only as a decision-maker, but also as a starting point for other actions.

### Blurring the Boundaries

Reports and search facilities have many things in common. Therefore, the hit display of a search help should be operated in a similar way to the completed report (for example filtering and sorting). In principle, the hit display can be interpreted as a report that is used to find and select certain entries.

In the case of complex search help where the amount of hits can be limited, these selection conditions should also show the same functions as report selection screens. Again, it is a case of having a task of a similar nature, suggesting a similar conversion.

This has led to the fact that in certain programs, the search principally takes place via generic or pre-defined reports with limited functions (that are geared to the task).

## What does this mean?

It is obviously an advantage if objects can be searched for without having to develop another special search help tool. Moreover, users no longer have to use two different tools for two different tasks. This reduces the amount of time needed to learn about the tools.

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## Structured versus Unstructured

### Structured

In this case, structured information means information that has been traditionally classed as a report. Here, data, characteristics, key figures, assignments and other attributes are presented in table or diagram form. The use of trees, grids, and other graphics is also usual. These structures enable diverse analyses. Reports do not always have to be created individually - a large proportion of report creation can be carried out automatically. Searching, sorting, filtering, highlighting and exceptions can be

used as desired on individual attributes.

## Unstructured

In contrast, documents that contain, for example, body texts, pictures, films, are unstructured information. They are often stored in different ways and created individually and manually rather than automatically. The search - apart from that of attributes in the document master record or document folders - is usually a free-text search using a text index that has been created with a special indexing program.

## Blurring the Boundaries

Now, attributes in structured data can also contain unstructured information. Shorter and longer text attributes, and even longer body texts, are not unusual in practice. Moreover, unstructured documents do not exist in a vacuum, but are usually also linked to structured data (not only by a document master record and document storage).

Moreover, a text document can contain tables and diagrams, and tables in reports often contain cells with body text. Users often want to insert text into their reports that give background information about the displayed data. Here the transition is blurred, and it is unclear what has the higher status in a concrete document: the body text or the tables and diagrams.

As already mentioned in [Stand-Alone versus embedding](#), information is often not useful alone, but needs to be explained by its context. This is, of course, also true for the interaction of structured and unstructured information. Therefore, here too the operation of both types of information should remain as similar to each other as possible.

With information exchange, structured reports, as well as other documents, also have to be exchanged and distributed, and it users have to be able to add comments afterwards, not only on paper. Here it is also important that the information can be assigned in a targeted way within the document. In addition to this, comments that have already been made in the data source should also be accessible, without ruining the view of current data.

This means that reports and (in the case of report creation) their fundamental components, are searched for by attributes and parts as well as by their description. A data source can, for example, be searched for according to its fields or attributes, such as author, as well as by the descriptive text.

Lastly, it must be said that searching for documents, when not using a text index but using document master record attributes, can be seen as master data reporting (see also: [Search help versus Report](#)).

## What does this mean?

The interlocking combination of structured and unstructured information allows information to be distributed better and more comprehensively. Moreover, learning and changeover expense is clearly reduced if the breach between them is removed.

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## Templates versus Snapshots

### Templates

A template stores the entire "look" of the report, but not the data. The data is read from the database and added to the layout when the template is called up.

### Snapshot

On the other hand, actual reports that can exist both on screen and on paper contain data that is valid at the time of their creation. This is important for archiving, or if data from a particular point in time needs to be kept for some special reason.

### **Blurring the Boundaries**

If, as often happens, reports or report templates are created with a report creation tool (perhaps in a scaled-down version) they can obviously be altered later and used as the basis of further reports or report templates. Often, it is sensible, or even necessary, to change the sorting or outline of a report in order to provide a better overview, or to add more information to explain the data that is displayed.

Thus, there is often little distinction between report templates and reports - each template can in principle be saved with the information that was valid at the time of its creation. As long as the report is not being displayed offline, the data can be updated in order to show a more up-to-date set of information. In cases where current data is not actually needed, the performance is improved, as the current data is only examined when necessary.

### **What does this mean?**

The decision of whether to use a template or snapshot can normally be avoided or delayed. It hardly adds to the employee's workload, if at all.

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**Source:** [Reconciling Conflicts in Reporting](#)

## Uniformity and Diversity of Reports and Tools

[Preconfigured versus Customized](#) | [Individual versus Generic](#) | [One Tool versus Several Tools](#)

How accurately can software producers anticipate user requirements? At the end of the day, what should be left to the customer or end-user? How can special demands be integrated most effectively with standards? These problems will be addressed in the following points:

- [Preconfigured versus Customized](#)
- [Individual versus Generic](#)
- [One Tool versus Several Tools](#)

Résumé: By choosing the right standards, adaptation to individual demands can be both simplified, and accelerated, considerably. Therefore, the main focus should not be on a wide variety of complete solutions, but on a well-modulated system.

### Pre-configured versus Customized

#### Pre-Configured

As a rule, producers of standard software also offer a (varying) number of standard reports. Especially when there is a large amount of legal, and other format and layout standards to be observed, such reports that are delivered with the software can drastically reduce the software-introduction phase.

But even in other areas, companies - especially those that are too small to be able to assign a large number of employees to creating reports - can profit from having reports that can be used straight away.

#### Customized

On the other hand, customers have company, departmental and user-specific requirements that cannot be taken into consideration in pre-configured standard reports. Even more than in transactional programs, customers want to create their own reports and, if necessary, do not mind making the additional effort required.

#### Blurring the Boundaries

For most users, it is a big advantage if there is already an accessible template, or choice of possible templates, on which they can base their reports, rather than starting from scratch. This can save time as the user does not have to redefine every little detail. In addition to this, such templates contain ideas and information on using certain features that cannot normally be easily found in documentation.

Since many companies underestimate the time needed to create reports, the above method can prevent bottlenecks. Therefore, predefined reports and modules have to be delivered in all areas, even in those where they are not expected to be used in their exact form in the customer's operational business.

#### What does this mean?

The creation of a reporting landscape is accelerated up considerably if templates are provided. This does not mean that individual requirements, for example, on layout, design have to be sacrificed.

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## Individual versus Generic

### Individual

Different applications have different requirements. Different employees have different tasks to complete and different knowledge. In each area, employees want tools that are as efficient as possible and that are geared toward their duties. This also applies to reports. Therefore there is a demand once again for ease and flexibility of making individual adjustments.

### Generic

On the other hand, the concept "If you know one, you know them all" has also been proven to be useful. Users do not want to have to get used to a new layout every time they use a report - they prefer to have certain general standards. Moreover, they want to be able to carry out changes in the same way wherever possible and do not want to have to get used to another user interface.

### Blurring the Boundaries

The creation of a library with generic modules of differing granularity that can be combined as required, and if necessary, adapted to meet special requirements, could provide a solution to this problem. This enables users to create reports quickly and easily, retaining a sense of uniformity yet not preventing individual solutions (see also [Flexibility versus Layout](#) and [Pre-configured versus Customized](#)).

### What does this mean?

The creation of reports, and therefore the supply of required information, is made quicker. Despite individual tailoring, there is still some common ground that enables users to get to grips with a new report more quickly.

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## One Tool versus Several Tools

### One Tool

As we have seen, the topic of reporting covers a vast area. Depending on for whom, when, by whom and in what way reports are being created, there are completely different requirements for creating the reports and also for displaying them. Just as it is not sensible to try to build a vehicle that can be used as a lorry and as a sports car, so there cannot be a tool that is as well suited for media-gearred high level presentations as for ad-hoc analyses.

The requirements are too numerous and too varied to be grouped together in one tool, and still be easy to understand and work efficiently. In reporting it is also important to have tools not only for specialists who work with them regularly, but also for the occasional and/or untrained user.

### Several Tools

On the other hand, it appears that using several specialized tools also has its dangers - especially if these tools are operated in

different ways. When, as is often the case, a user works with different types of reports, each tool must be learned separately. This can require quite considerable effort. Moreover, if programs are operated in different ways, users need to pay more attention to what they are doing, so that they do not mix up the programs.

## Blurring the Boundaries

One way round the dilemma is to provide several specialized tools whose common functions work in the same way. This means that users do not always need to go to as much effort to finding out about the program they are currently working with. The users do not need to know whether the common functions are realized within the programs by generally used modules or not. The obvious advantage of this is that maintenance is reduced and the user interfaces do not diverge. However, this solution is not always possible, because of program architecture. Moreover, it is important to ensure that the intersection of the functions offered is not disjunct, that is, that there are many functions that are available in several of the specialized programs. Only in this way do users not have to decide between different tools that offer some, but not all, of the functions they need for one actual report.

This can be compared to a toolbox in a workshop: A hammer does not need to be suitable for planing down a plank, but when hammering a nail into the wall, the procedure should be similar to that of hammering a nail into a plank. Moreover, according to what is being built, a new, different tool is chosen from a large range of tools. Two or three tools removed from the existing toolbox would not be the optimized choice. There would be unnecessary tools among them (because they are not needed) or, worse, tools that are important for the job would be missing.

A beginner would at first use tools that are easy to use, but as they gained experience they would want to use more powerful tools. In the same way, report creation tools should provide obvious easy functions and not so obvious advanced functions that are nevertheless accessible. Moreover, these advanced functions must be easily available for experts, or at least there must be the option of making them easily available (by customizing or personalizing the program).

Especially if the person who creates a report is not the person who executes it, it should be possible to make some functions available and some not available in a modular system, and to influence how these functions are offered.

## What does this mean?

Users who create reports, as well as those who analyze them, do not have to learn how to use as many different user interfaces. Nevertheless, different functions can be made available individually in the completed report.

## Conclusion

As we have seen, many distinctions are significant for orientation purposes, but a hindrance if they create boundaries in reporting software. The key phrase is: Flexible integration. We have seen where this integration is possible both in principle and in practice today, or in the near future. The program designer's task is to turn these possibilities into reality, so that users are equipped to deal with the demands of today's fast-moving and globalized society.

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