User's manual

HAT 5.3

Business Navigator

November 1, 2007

1

Using the manual

Purpose and scope

The main purpose with this manual is is to describe the functions that are unique to HAT, not commands and techniques generally used in the operating system. It is assumed that you have already acquired this general knowledge, elsewhere.

HAT 5.3 works on different platforms (PC and Macintosh), and operating systems (Windows 95/98/me, Windows NT, Windows 2000/XP/Vista, MacOS 8, MacOS 9, and MacOS X).The illustrations in this book are made from a Windows system. They may look somewhat different from what you see on your own screen. But the deviances are very small, and should not cause any ambiguity. The few cases where the Macintosh version differs substantially, are marked as in the following remarks, on a few general differences that are only mentioned here:

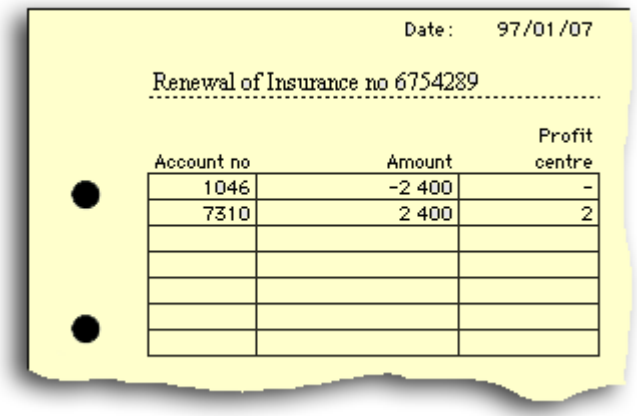
MacOS

- Use the Command-button on Macintosh, instead of the Ctrl-button in Windows
- Use the Option-button on Macintosh to get the function that is provided by Alt Gr in Windows (in HAT for PC the AltGr-button is used to change something to the opposite meaning, e.g. change the cursor from + to –)
- Use Right-click or Ctrl-click on Macintosh, instead of Right-click in Windows

The example file – Demo Inc

Many of the illustrations are based on the fictitious company *Demo Inc*, with a HAT-file based on its general ledger (accounting data). The data have the following structure, in this particular case:

- The basic records are the accounting vouchers (called *Cards* in HAT), documenting business transactions in the way this is regularly done in any accounting system.



  Each voucher has a date, some text describing the business transaction, and a number of line entries (one for each account that is affected). The line entries are generically called *Lines* in HAT.

- Each transaction line in a voucher contains the fields:
  - amount, in dollars (positive for debit, and negative for credit values)
  - the account

- the profit centre affected (in Demo Inc only for cost or revenue entries, not for entries affecting balance accounts)
- a field stating if an actual or a budget value is at hand

This description of the example file is only introductory, more details will follow later in this manual.

Navigating in the manual

The contents in the manual follows the logic of the HAT menus. You can keep it as a computer file and read it on the screen. But it is also designed to give a good printout, if you prefer.

You may read the manual in different ways, depending on what you would like to achieve. If you are a new HAT user, you may initially want to read it as an ordinary textbook, from the first page to the last. Some prefer to print it on paper for this specific use. Later on you will use it as a reference document, to look up certain commands or features. For this use the electronic version is much easier to work with. Use the free text search function (Find) in Acrobat Reader, or click in the contents catalogue, to the left, to find the relevant section.

Reference material

There are a lot of smart features in HAT, that are of great interest for specialists developing HAT applications, used for automating update production or “power users” who want to do series of tasks much simpler and quicker. These features are described very briefly in this manual. More detailed descriptions (of a reference nature) are available over the Internet.

At the relevant places in this manual there are links (URLs) that allows you to read this reference material online. You also get the opportunity to get this material attached as part of this manual. It will then the be added, in pdf-format, at the end of this manual. If you choose to save the manual after this addition, it will become an integral part of the manual. The corresponding bookmarks will also be generated automatically.

As usual, the links are blue and underlined, as in this example dummy (which has no other function than illustrating how it looks).

2

General about HAT

The rationale of HAT

The problem

Every organisation generates a lot of operational data as a result of its activities. These data constitute a source of potential information on the business. Information that is often badly needed, especially by managers at different levels. But the operational systems are not primarily designed with efficient analysis in mind. Usually some kind of report generator or executive information module is built-in, or can be bought as an add-on software. Alas, they are – more often than not – rigid, difficult to work with, and slow. For example, in order to get reasonable response times, they often work with aggregated data, to reduce the volumes of data. But the analytical features become very shallow.

The HAT solution

The guiding principles behind the construction of HAT has been:

- Analyses include all kinds of operational data. Also combined data, from different sources, e.g. sales, accounting, and manufacturing data.
- Very large volumes (”mainframe volumes”) should be available to the analyser, without aggregation and loss of details.
- The analysis should be very quick. It appears to be a common human trait, that a response time longer than a few seconds is frustrating, and reduces the motivation to do a proper analysis.
- The presentations should be easy to comprehend, flexible, and suited to the needs. Often a graphic overview is far better than a table of numbers. But you may also want to see the exact figures, in two decimal places. It all depends – and HAT should adapt to the instant need.
- HAT should support a natural chain of thoughts. A certain compilation may not give the final answer, but rather raise new questions. By intuitive point-and-clicking, you should be able to follow through, and get further information and more detailed explanations.

Fundamental concepts

The reality

Business transactions and documents

Every organisation generates a lot of data. Even the small one-man consultancy firm manages has a simple accounting system. Large companies typically have systems for manufacturing, delivery, payment, storage etc., each generating large volumes of data. A bank may process millions of transactions per day. All these systems have one common denominator – at the entry point of the data into the computer systems, the fundamental entity is some kind of input *document*. Often

this document is physically manifest in the form of one or many paper documents, but to a larger extent these “documents” only exists electronically. In whatever form, each document describes some sort of business transaction, and all the data relevant to this transaction are entered on the document.

The contents of the documents

Depending on the type of operational system, the input documents have different contents, of course. But a clear majority of them share a few common features:

- They contain one or many numerical values, e.g. representing dollars, number of sold units, number of hours worked, number of units delivered to the storage, etc.
- A time stamp of the business transaction. Usually the date, sometimes also hour, minute, etc states when the transaction occurred.
- A number of attributes of the numerical values. Which account is affected, which profit centre should get the credit, what product were involved, who sold it, where was it sold, … etc.

Obviously all these data constitute a potential source of information, in search of a good tool to explore it.

The structure of data in HAT

Every useful database represents something external to itself – ”the reality”. The HAT database is constructed to make it easy to map data from the operational systems, as we know them, to the data structures available in HAT.

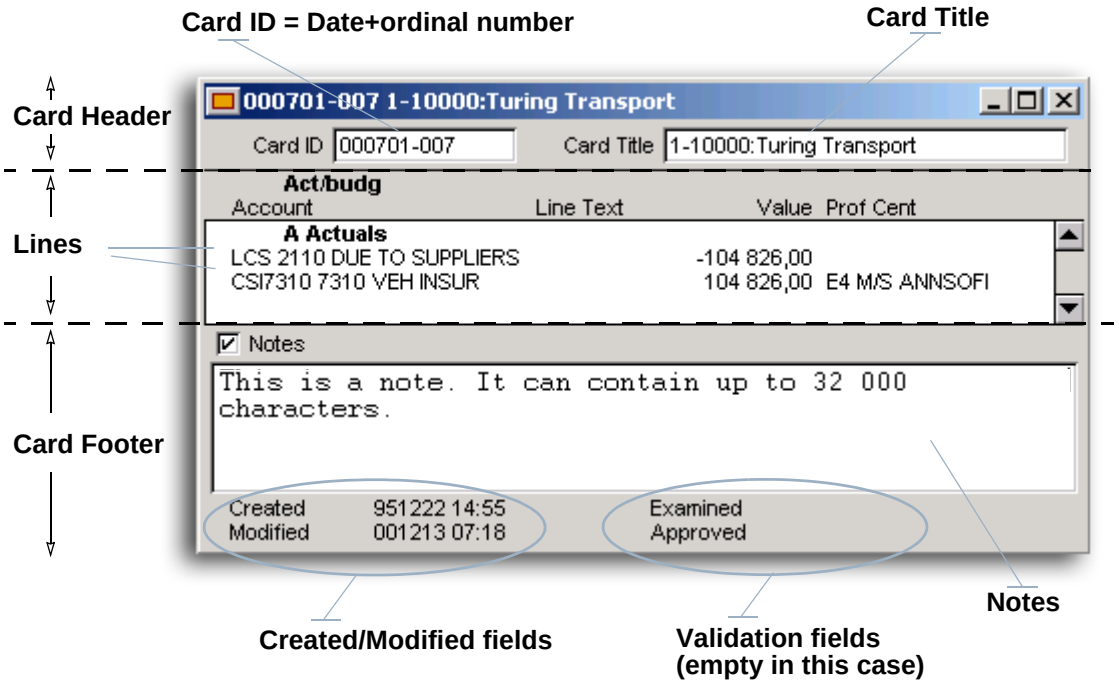
The two most important structural elements in a HAT database are:

- The Cards/Lines record structure
- The Dimensions

Cards and Lines

Card is the generic name of the basic unit in a HAT database. It is intended to represent a business transaction document, as mentioned above. Usually it has a physical counterpart in the form of a voucher, an invoice, an account statement, an order etc. But there are exceptions. In some cases we let HAT create ”synthetic” Cards, i.e. Cards that exist only in the HAT database, without any exact correspondence to documents outside the database. E.g. we may let HAT group a flat file of sales transactions into separate Cards.

Each Card has at least one *Line* – usually many. One Card can have two Lines and another two thousand Lines, it often varies a lot. The following example shows the general anatomy of a Card in HAT. In this case illustrated by an accounting voucher from the Demo Inc database:



An intermediate level – Groups. Looked upon as a hierarchical structure of record types, one subordinate to the other – Cards are at the highest level, and Lines at the lowest. These are the practically and conceptually most important ones. But there is also an intermediate hierarchical level, the *Group*.

Card 1
  Group 1
    Line 1
    Line 2
  Group 2
    Line 3
    Line 4
    Line 5
Card 2
  Group 3
    Line 6 … etc.

Although not as important as the record structures of Cards and Lines, the Group structure can be useful in some applications.

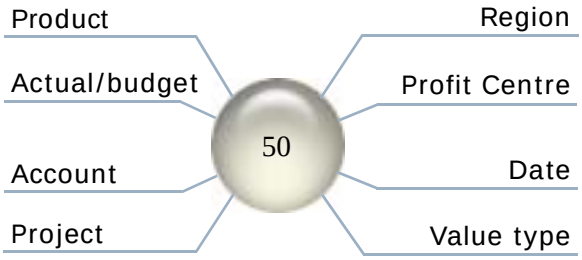
Example For a company consisting of many independent business units with a lot of business transactions between them (internal transactions), you may want the entries for all parties involved in the transaction, on the same Card. By treating the business units as Groups in the HAT application, you gain both practical and conceptual simplicity.

Dimensions

HAT is a multidimensional tool, with the option to use up to 32 user-defined dimensions. In addition, the time dimension is an intrinsic part of every HAT database.

In the same way as a point in physical space is defined by its position in three dimensions, a business transaction is characterised by its “coordinates” in a number of HAT dimensions. Each Line in this HAT database has exactly one numerical value. Depending on what type of data that has been entered into HAT, each number gets different attributes. E.g. in this example file each numerical value represents a dollar value. This dollar value has a date, affects an account, refers to a certain profit centre, and is either an actual outcome or a budget value. The following picture illustrates this particular case:

But it may look very different in another company, or for an another type of data. As in this case, where a lot more ”attributes” are registered for each value:



To keep it simple, only one value type is used in this example. But HAT allows you to use up to 24 different value types. Cases with more than one value field will be illustrated later in the manual.

In the same way as we need a ”reference system” to define a point in the physical space, we work with *Dimension charts*, in a HAT application. For each type of attribute we use one HAT dimension. The dimension chart describes the internal structure of the dimension. The basic elements in a dimension chart are its *components*. In the Accounts dimension, individual accounts are examples of such components. The components are usually structured hierarchically within the dimension chart. The Accounts dimension chart for Demo Inc has the following structure (in outline only):

Account name	Account number
Assets	
Cash and Bank	
Cash	
Bank	
Postal Giro	1020
PK-Bank	1046
PK-Bank S-Account	1048
Other Current Assets	
Fixed Assets	
Liabilities and Equity	
Revenues	
Costs	

Most of the components in this overview represents groups of subordinate components. The components that have account numbers specified, are displayed at the lowest possible level. All other components have sub components, possibly thousands. The construction and use of dimension charts are explained later in this manual. Dimension charts and their components are fundamental to the use of HAT.

Types of dimensions. All the 32 available dimensions but one, are fully equivalent from all aspects. The exception is that a component you assign to the *first* dimension will always be treated as a *Group*. In many cases this special status of the first dimension does not matter practically, and you may not even notice it. The Group concept is explained earlier in this chapter (see “An intermediate level – Groups” on page 8).

HAT-data in the computer

The HAT database and the HAT-file

When you work with HAT, you are working with the database residing in RAM. This is what we call the *HAT database*. When this HAT database, or part of it, is stored on a permanent secondary medium, we call it a *HAT-file*.

Structure of a HAT database

The HAT database consists of three major logical parts:

1. the *Cards database*, i.e. the representation of all the raw data entered into HAT

2. the *Dimension structures*, i.e. the set of dimension charts with their internal hierarchical structures
3. the *Parameters parts*, i.e. collectively all the other data that are not included in the Cards database or Dimension structures. In this we find passwords, file dates, installed templates, etc.

These are the logical parts of the HAT database, which we will refer to in this manual.

Structure of a HAT-file

A HAT-file that corresponds to a fully developed HAT database, consists of a large number of different *file sections*. You may occasionally want to save only a part of a HAT database to a HAT-file, e.g. only the section containing the dimension charts.

Three file formats

When a HAT database (or a section of it) is saved to a HAT-file, it is usually saved in the specific HAT-format called *HAT Normal* (or just *Normal*, for short). As such it is encrypted (if a password has been defined), and often also compressed.

The other two formats are *HAT-Text* and *HAT Browser*. When you choose to save the HAT database in HAT-Text format, it will be an ordinary text file, which can be opened and examined by any text editor (e.g. Microsoft Word).

The option to save the HAT database in HAT-Browser format is only available if you have a HAT with Server-functionality on the computer. A HAT-file in HAT-Browser format has the advantage, that it can be opened and used by the HAT-program, which is available for free download, via Internet. This program relates to the full HAT program in the same way as Acrobat Reader relates to the full Acrobat software.

When working in any flavour of Windows, all HAT Normal and HAT Browser files will have be saved with the extension .HAT. The HAT-Text files will get the extension .HAX. It is usually best not to change these extensions. You can associate all files with the .HAT and .HAX extension to the HAT application. The files will then show up with the HAT icon, and you can open them by double-clicking on their icons.

MacOS

Any HAT-file will automatically show up with the correct icon and will be opened by double-clicking the icon, regardless of its name.

Relation between a HAT database and its HAT-file

The relation between the logical parts of a HAT database, and the file sections in its HAT-file is illustrated in this table:

Logical part in the HAT database	Sections in its HAT-file
Cards database	Cards section (preceded by ##Cards)
Dimension structures	All dimension sections (preceded by ##Dimension 1, ##Dimension 2, etc.)
Parameters parts	All other sections

If you save a HAT-file in HAT-Text format, you can easily see these sections by opening it in a text editor. A section always starts with the characters ## followed by a name, e.g. the Cards section starts with ##Cards.

Operating systems and hardware

Computer platforms

HAT 5.3 supports a number of different operating systems:

In the Microsoft Windows family	Windows 95/98/ME
	Windows NT 4.0
	Windows 2000
	Windows XP/Vista
In the Macintosh family	MacOS 8/9 with PowerPC processors
	MacOS X

Old versions of HAT (until HAT 4.0.4) works with the older Windows 3.1. If needed, use HAT 4.0.4 on such systems.

The HAT-files are *file compatible* between these platforms, i.e. a file saved in one of these systems can be directly opened in the other, provided the same version of HAT is used on both platforms. As usual with all software, you cannot always expect to be able to open newly produced files, with older versions of the software. This also goes for HAT 5.3 – you can open an old HAT 4.1 file with HAT 5.3, but not the other way around (i.e. it is *backward compatible*).

Depending on operating system, you need different versions of the HAT program. Consult the current product presentation (e.g. via Internet), to get latest information on this matter.

HAT-processors

The regular HAT-program can only operate if a special PC Card, called *HAT-processor*, is attached to the computer. Depending on type of HAT-processor different functionality is available:

HAT-processor	General functionality	Special features	
Analyser	All types of analysis.	–	–
Operator	All types of analysis.	Import text files, and create HAT Normal-files	–
Server	All types of analysis	Import text files, and create HAT Normal-files	Create HAT-Browser files

Note that the same HAT-program is used, only the available type of HAT-processor determines what you can do with the program.

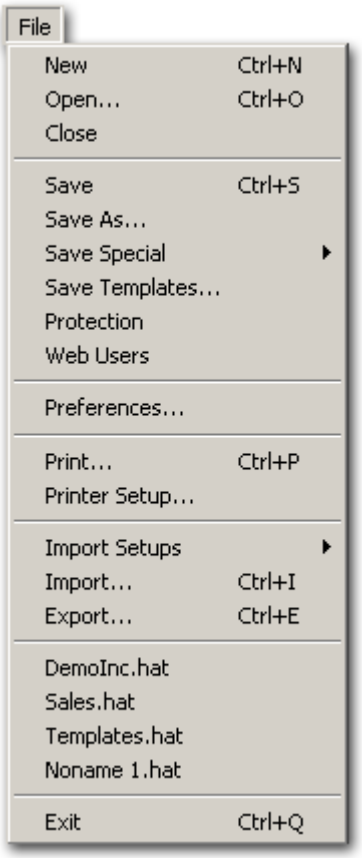
To create HAT-Browser files you have to use a Server-processor. The distinguishing feature of a HAT-Browser file is, that it can be opened (and used) with a special type of HAT program, the HAT Browser program, which does not require any HAT-processor. Its functionality is limited to opening reports already installed, but still allows the user to interact extensively with these reports, changing views of the contents, drilling-down to see further details, etc. But it has no support for making fundamentally new types of analyses.

Multiple users

If a HAT file is located on a host server, several users can open the file simultaneously. If one user changes the database during a multiple user session, HAT will, if required by a preference setting, issue a warning to the other users.

3

The File Menu



Introduction

Many of the File menu commands in HAT are standard operating system commands. It is assumed that you are familiar with these. The commands that are specific to HAT will be explained in this chapter. If the command is disabled, it has no function in the current setting. Some commands also have a shortcut as defined in the menu – e.g. Ctrl+S means that keeping the Control-key pressed, and simultaneously pressing the S-key, will save the current HAT database to disk.

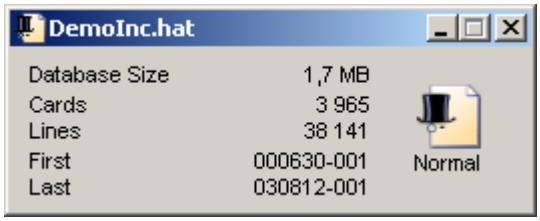
Commands in the File Menu

New

Will create a new empty HAT database.

Open…

Will open an existing HAT database.



You can open several HAT-files simultaneously in HAT. The number of open databases is limited only by the size of the files and the available internal memory.

If you open a HAT-file by double-clicking on the file icon, the system will load the file into a new instance of the HAT program. If you want to open more than one file in one single instance, you can either open it from within the HAT instance (i.e. using the Open ... command), or drag-and-drop the file icon into the HAT program window.

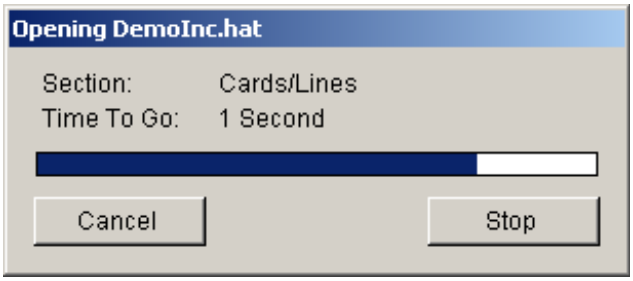
You can open up to three different HAT program files, each of which, in turn, can hold numerous different HAT data bases. Each additional open HAT program file occupies another 0,5 MB RAM.

MacOS
In MacOS, the files are always opened into the same HAT instance. You have to duplicate the program file, and open the duplicate, in order to load a database into a different instance.

If a HAT-file is located on a host server, several users can open the file simultaneously.

If the file previously has been saved with a password, you will be asked to enter the password. Type it and click OK to open the file. The password is not case-sensitive (see “Protection” on page 25).

The process of opening the database is displayed graphically. An estimate of the remaining time to open the file is shown.



Stop halts the loading of the file, and keeps the data that is already loaded in the internal memory (i.e. the database will be truncated).

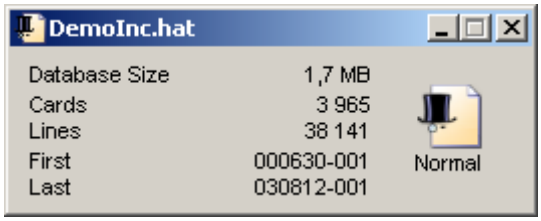
Cancel cancels the process altogether, and deletes the data already loaded, from the internal memory.

You can switch control to another application and let HAT open the file in the background.

If you try to open the same HAT file more than once, a warning message is displayed.

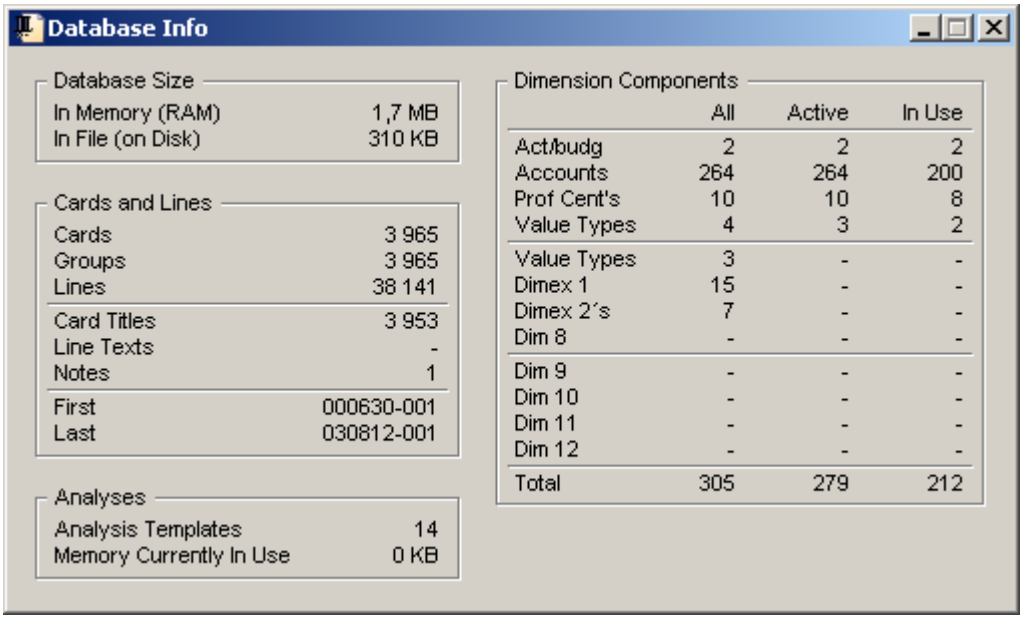
Information in the database window

The database window contains some basic information about the database:



If you click on the icon to the right, you will see a more elaborate description, with a number of statistics on the current database. Clicking on the icon is a

shortcut for activating the menu element Database Info, in the Database menu. Regardless of how it has been activated, it looks like this:



This Database Info window tells you

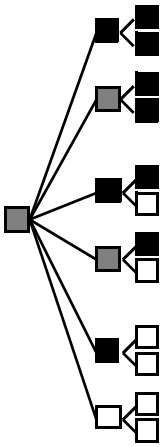
- that the HAT-file (i.e. on disk) has the size of 310 K bytes, and that it occupies 1.4 MB of RAM when it has been read into the internal memory
- the number of Cards, Groups, and Lines
- how many text strings (Card Titles, Notes, and Line texts) that are included
- that there are 14 Analysis Templates installed; as no template is active, they currently use no internal memory

The meanings of All, Active and In Use, for the Dimension Components, are as follows:

All. All components in a dimension chart, e.g. 264 accounts in the chart of accounts.

Active. All components affected by Lines read, either by direct component coding or by accumulation to higher level components.

In Use. All components which are directly coded.



The differences are best explained with an example. E.g. for a chart of accounts:

■ There is at least one value in the database that has this account directly coded as an attribute, the account is “in use” (it is then also active, see next entry).

■ An account not in use by direct item coding, but it has a subordinate account which is directly coded, i.e. it will be affected by accumulation of values up in the hierarchical tree; the

account is then called “active”.

□ Account neither in use nor active.

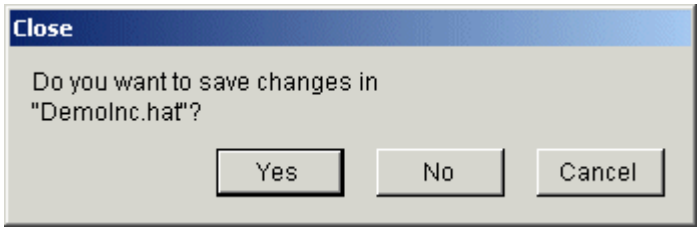
In this example, the number of accounts in each category are:

All	Active	In Use
19	12	9

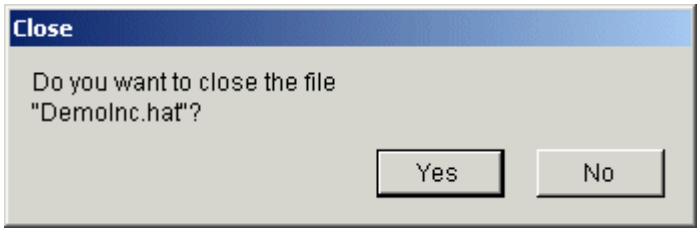
The information in the Database Info window is updated continuously when it is open, which means that it consumes some processing power. So, if you do not need the information, it is better to close it.

Close

Will close an open HAT database. If you have made changes to your database, a Save dialogue will be displayed:



If you have not made any changes, a confirmation dialogue will be displayed:



This is to prevent you from accidentally closing a database, which may take some time to reopen.

MacOS
The Yes/No buttons are named
• Save/Cancel, if the Save dialogue appears, and
• Close/Cancel, otherwise

Save

Will save the active HAT database to a file, without changing the name. If the HAT database is not changed, the command is dimmed.

Save As…

Will save the open HAT database to the place you choose, with the option to set a different name.

Save Special

Gives a multitude of options for what will be saved, and in what format. The settings can be installed[1] as a Save Setup, for further use at a later stage. It can be used exactly as it is defined, or as a base template which you modify. You have to give it a name in order to be able to install it.

In general you use Save Special to save the currently active HAT database, when you want to

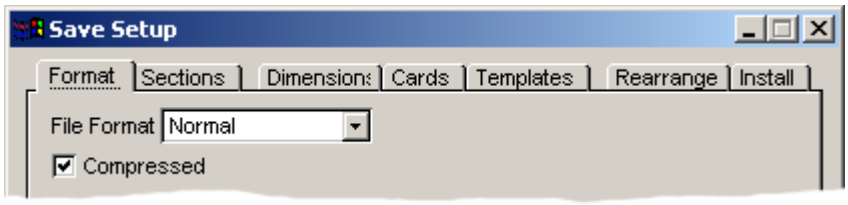
- change the file format, or if you want it to be compressed
- save a selection of file sections and/or subset of Cards or Lines. A common use is to save your personal templates as a small file, for later use with other data; your own templates can then be imported into the new HAT database
- determine which dimension components are saved, and what dimension codes to use
- save a subset of the installed templates
- rearrange the order in which the dimensions appear

Save Special with the option New Save Setup will open a dialogue window, with a number of tabs – every tab with its own settings.

The tabs are as follows:

1. Note that the operations Save and Install are not the same. When you save a HAT database, it is saved to a file, usually on a hard disk. When you install something (e.g. a Save Setup) it is inserted into the HAT Database, which resides in the internal memory. Not until you save the HAT Database, will it be saved to the hard disk, together with the other data in the database.

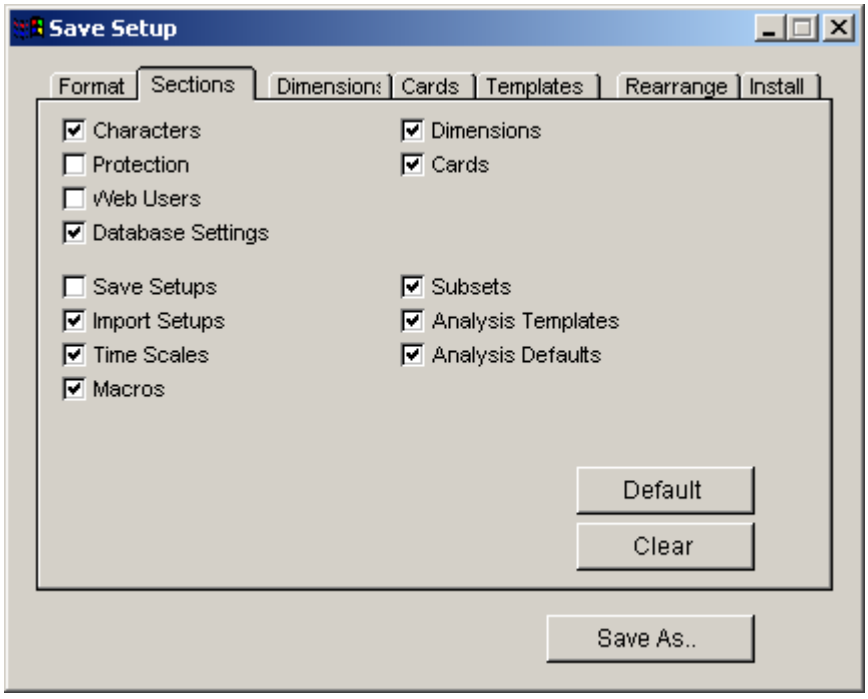
Format



File Format. Choose between Normal, Browser, and Text. The Browser format is available only if you run the HAT program with a Server-processor attached to the computer (see section “HAT-processors” on page 13).

Compressed. If the file is not compressed it will become larger, but the save and open operations will go quicker. The difference is more significant for the saving operation. Note that this setting does not affect whether the file is protected by encryption, or not. If you have very large files which need frequent saving operations, it is often a good idea not to compress it until you save it the last time.

Sections



- Default will select all sections in the HAT database that are currently used.
- Clear will clear all sections.

Characters. Should normally be included. The purpose of this section is to ensure that international and special characters are correctly handled. Text files always use the native character set from the operating system, but when moving a text file over an operating system boundary, character conversion may or may not occur. If the Characters section is included in a text file, it will be converted in the same way as the rest of the file, ensuring a correct interpretation. If you are working in one operating system only, you can safely ignore this section.

Protection. If a password is stated and this section is not included, the remaining HAT-file will not be protected. Note also that a HAT-file saved in HAT-Text format will expose the password. It is therefore a good idea to exclude this section, when you save a HAT-file as text. In case you would forget this important safety measure, HAT will display the following message if you try to save the database as a text file:

Web Users. Will save the list of web users as defined in File: Web Users. See “Web Users” on page 27.

Database Settings. Will save your settings in Database Settings...(see section “HAT-processors” on page 13).

Save Setups. Will save user defined Save Setups.

Import Setups. Will save user defined Import Setups.

Time Scales. Will save user defined Time Scales.

Macros. Will save user defined Macros.

Dimensions. Will save all dimension charts. This setting can be further specified on the next definition page – Dimensions.

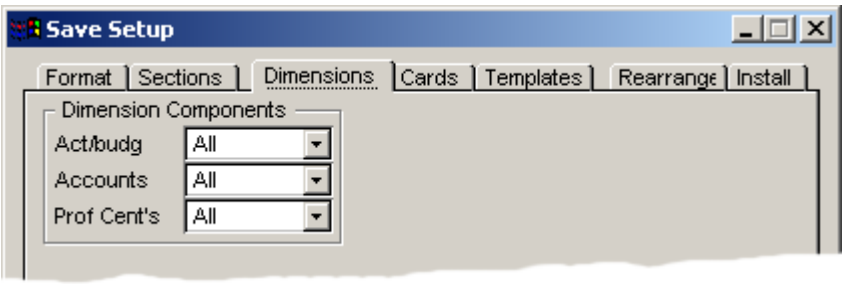
Cards. Will save all Cards or Lines, as specified on the Cards definition page.

Subsets. Will save all subsets.

Analysis Templates. Will, if marked, save user defined analysis templates. Depending on the settings on definition page Templates, all templates, a ”filtered” subset, or only the currently open ones, will be saved. See section “Templates” on page 23.

Analysis Defaults. Will save all Set Defaults for each type of analysis.

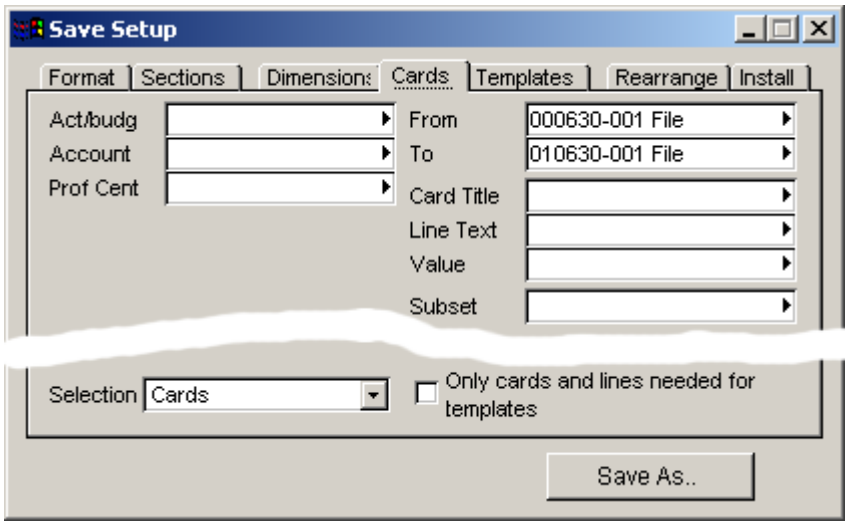
Dimensions



When you save a HAT database or a part of the database as selected in Cards, you can decide to include All components, only Active components or only components In Use, in a dimension. None will completely exclude the dimension. For an explanation of All, Active, and In Use, see section “Information in the database window” on page 16.

Cards

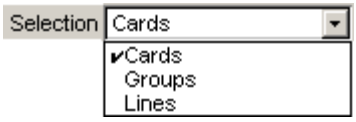
On this definition page you enter a selection in the same way as in an Analysis Template:



E.g. to produce a HAT-file containing only data for one single profit centre – enter its component in the Prof Cent box.

Only cards and lines needed for templates. If you want to reduce the database size to a bare minimum, without jeopardizing the data required to correctly show the installed templates, you can select this option. It is typically relevant when saving Browser-files. If a recipient of a Browser-file uses a HAT Browser-program to open it, there is no point in providing data “outside” that defined by the set of templates, because they are invisible to the user, anyhow. Occasionally the file size can be reduced substantially, which is often desirable if you send the file using the Internet.

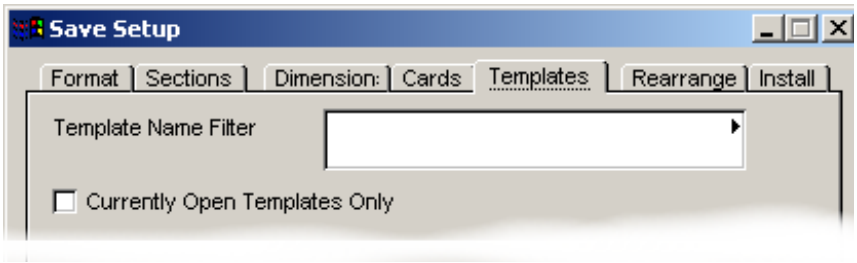
Selection gives you the opportunity to save different parts of the Cards:



Cards	If at least one Line in a Card is included in the selection, the whole Card will be saved in the file.
Groups	If at least one Line in a Group is included, all the Lines in the Group will be saved.
Lines	The Cards will be stripped from Lines not included in the selected subset (but all Card level data will be included).

Templates

Specifies which templates are saved with the file.

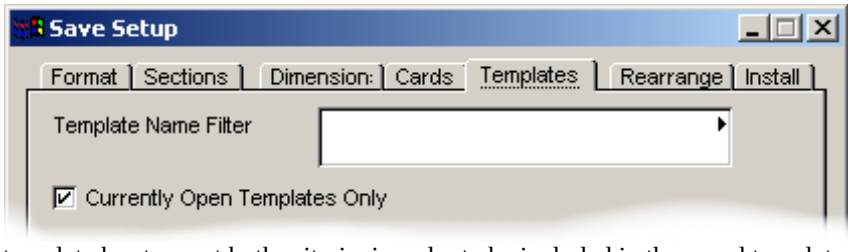


Template Name Filter. The Template Name Filter acts as a selection criterion on the name of the templates. The selection will be performed according to the rules of simple search texts. See section “Selection Boxes – Text” on page 109, for more detailed information.

Example The filter ”key ratio” will save all templates which contain ”key ratio” in their names.

You can also enter specific template names by clicking on the small pop-up arrow in the upper right corner of the entry box. The list of the first-level template names will then appear, and such a name can be chosen with a click.

Currently Open Templates Only. You can also define what templates to save, by first opening them, and then tick this box.
This selection can be combined with the Template Name Filter. In that case a



template has to meet both criteria, in order to be included in the saved templates.

The pop-up arrow in the upper right corner of the text box, has two functions:

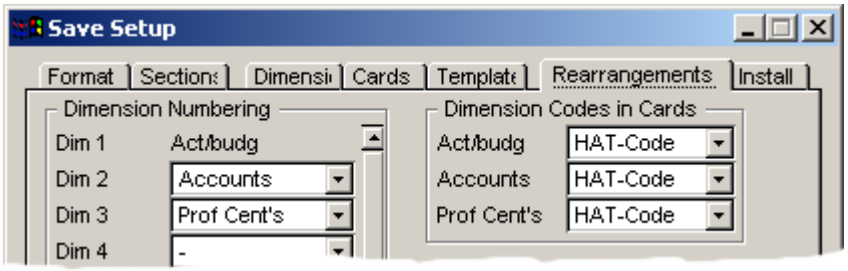
Left click	Displays a list corresponding to the highest echelon of template names.

Right click	Displays the full list of logical operators available to form simple or advanced selection criteria.

See section “Selection Boxes – Text” on page 109, for further details on how search expressions are formed.

Rearrangements

You may not be happy with the order between the dimensions in your HAT database. With the exception of the first dimension (depending on its special status as a Group), you can create a new HAT-file with the dimensions in another order.



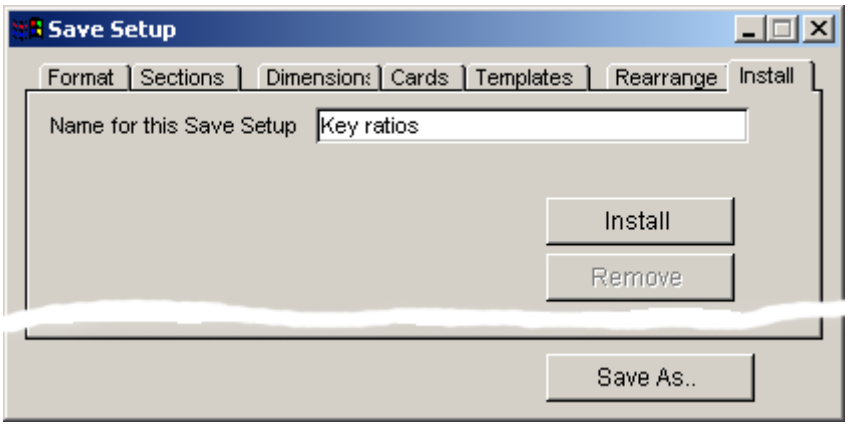
Dimension Numbering. You specify the new order under this heading. It is also possible to delete a dimension altogether.

Dimension Codes in Cards. You can choose to save the HAT-Code, Host Code or Text.

Example

Let´s assume that you have defined a completely new structure for a certain dimension. If you want the data to follow the new structure, you can often save the old file using the host code for this dimension (instead of using the HAT-Code which has a built-in structure). When data are then imported into a new HAT database, using the host codes, data will follow the new dimension chart.

Install



Name for this Save Setup. When you open a new Save Setup, this box is empty. Not until you enter a name in this box, will you be able to install it in the HAT Database (as it resides in the internal memory). You install it by pressing

the Install button. The installed Setups are then available in a submenu to the Save Special menu element.

If you make changes in an active Save Setup that is already installed, and try to close the setup window, you will be asked if you would like to change it, or add it to the list of already installed setups. If you try to add another Save Setup with the same name as one that already exists, HAT will change its name by appending the first unused integer at the end of the name.

To delete a setup, you first have to make it active. Either use the Delete Save Setup command in the menu (which will then be active) or press the Remove button on the Install tab.

Save As ...

Press this button to initiate that the actual HAT Database is saved to a file, according to your settings. You will be prompted for a name of the saved HAT file.

Save Templates ...

It is rather common that individual HAT users want to save their own templates, and only these. A typical case is when HAT files are produced centrally, and these files only have a few standard templates included. An easy way for a user to adapt this set of templates to his own needs, is to save the templates from an old file, and import this file to the new HAT database. They will then be added to the standard templates. Subsets that are part of a template definition are saved together with the templates in the template file.

Protection

You can specify a password for accessing the data in a HAT Database. This level of protection is often enough. But you also have the option to increase the security by requiring that a specific HAT-processor is attached to the computer, in order to be able to access the data. You can list a set of HAT-processors that are authorized to open a certain HAT-file.

If you try to change the password, you have to enter the old one first.

A password can be up to 1023 characters long (letters, digits, or other characters). The password is not case-sensitive, i.e. the password

wordPASS

is equivalent to the password

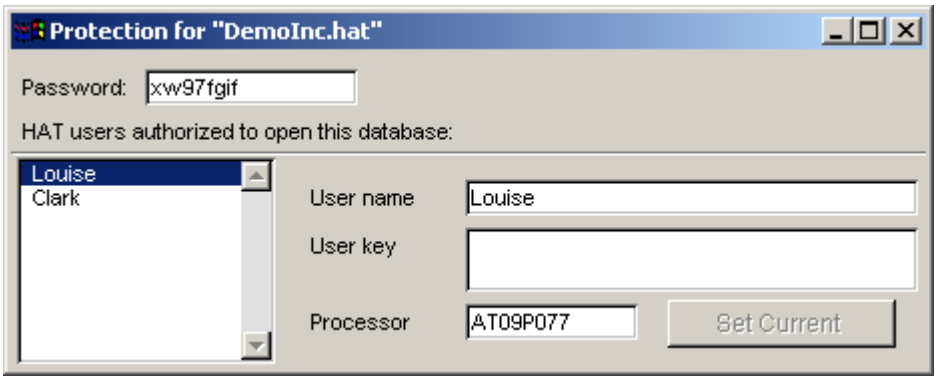
WORdPass


Warning!!

The password only works as intended if the HAT database is saved in the Normal or Browser file formats. When the file format is set to HAT-Text, you must be careful not to expose the password in the HAT-Text file, by mistake. If the option Protection is marked in the Save Setup (see section “Protection” on page 21,

regarding definition pages), the password will turn up in the text file (that can easily be read by using any common text editor) . Therefore, as a rule, never save a HAT database in text format, without making sure that the entry Protection is unmarked. Unless you really want to show it, of course. If you try to save to a HAT-Text file with a password in it, the following dialogue window will give you a last chance to change your mind:

Define password. Enter a password, and – if you want the additional security – the serial numbers of the authorized HAT-processors



Processor-IDs are not easy to remember. You may want to add the User name of the owner of this processor, e.g. ”Clark” in this case.

The file can now only be opened by a user who has any of the listed HAT-processors installed, *and* enters the correct password.

You add a HAT user, by choosing New Authorization in the Edit menu. Choose Erase Authorization to delete it.

If you have an “empty” user you can let HAT fill it in with the currently attached HAT Processor, and the User name of the user who is logged in, by pressing the button Set Current.

Note. The User key field is only relevant to users with HAT functionality based on recurrent activations. It has no use for an installation with a HAT Processor.

Change/Remove password

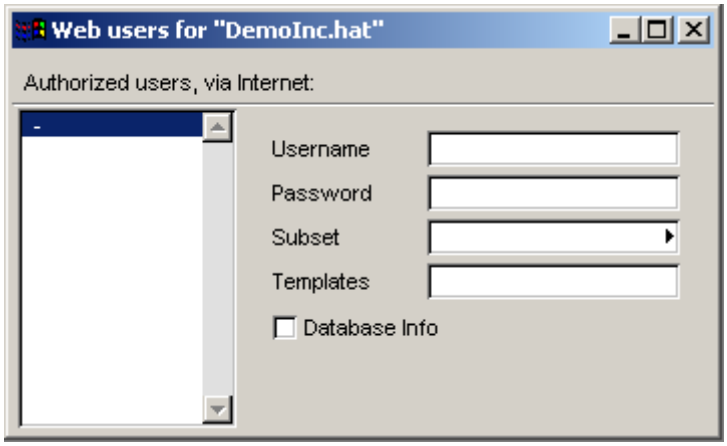
You can change the password for a file that is already protected. First you will be asked to enter the current password.

If you leave the password field empty, the file will be saved without a password. However, you can still restrict the use of a file to a specific HAT-processor.

Web Users

If you have a HAT Server Processor installed, HAT can provide information over the Internet, by cooperating with Internet Information Server (IIS) on a Windows system, or an Apache server hosted on a MacOS X computer.

The Web Users entry is used to authorize named users.You can enter a new user from the Edit menu , with the command New Web User. It will look like this:



Alternatively, enter a new web user by right-clicking in the Authorized users box.

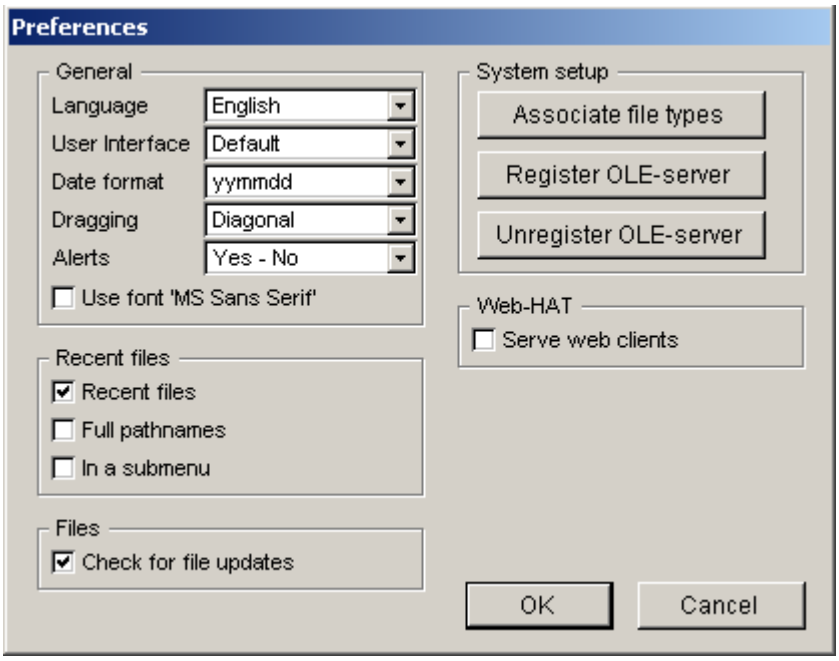
You also have the option to limit what parts of the database each user is allowed to see:

- Limit access to the data defined by one or many subsets, in the Subset field
- Make a certain subset of the installed templates available to each user, by specifying a filter in Templates (see “Template Name Filter” on page 23). Note that you can specify very complex sets of templates by using advanced text search expressions.
- Determine if the user will be able to see general data about the database, by ticking the Databas Info entry.

Preferences...

A number of basic elements can be set in Preferences.... These settings define how the HAT application works for all your data bases – they follow the HAT

program, not the individual database. Thus, the settings are stored in the user-specific part of the system registry, not in the HAT-file:



Note the difference compared to Database Settings... in the Database menu, which contains settings that which will follow the specific *HAT database/HAT-file*.

MacOS
In MacOS X you will find Preferences under the HAT menu.

General

Language

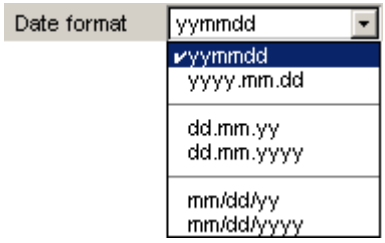
Will change the language in all parts of the HAT program, as soon as you close the Preferences window.

User Interface

The Default setting gives you the interface of the operating system you are currently working in. If you prefer you have the option to change to the looks of Windows 3.1, Windows 95, MacOS 7, or Mac OS 8. Note that this change does not take effect immediately. You have to exit the HAT program, and start it over again, to see the difference.

Date format

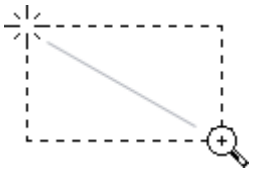
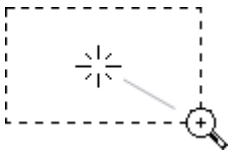
Determines how dates are presented in HAT:



This setting determines how dates are *presented* in the template Time functions. To enter time values in a selection (the From and To fields) the format yymmdd is always used.

Dragging

Specifies how the drag operation works, e.g. when zooming in:

Diagonal	Centre
	

Alerts

Choose between Yes-No or Do-Don't, as displayed alternatives in dialogue boxes.

MacOS

For Macintosh you have the additional option of setting two Printing options:

Color. Allows you to force the printer to print in black and white, or use colour/gray scale.

Resolution. Set the printing resolution to 1, 2, 3, or 4 times the screen resolution. Most printers produce the best result when "*2" is selected. Some high resolution printers may produce better pictures if an even higher resolution is used.

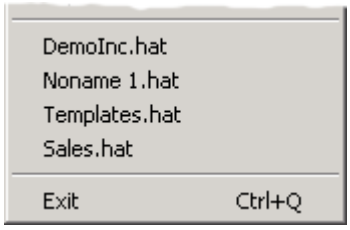
Use font 'MS Sans Serif'

Arial is the default font used in HAT. It is recommended that you use this if it works well. By setting the font to MS Sans Serif, you will get a wider support for local characters, e.g. in the Baltic countries.

Recent files

Recent files

If you mark this entry only, the names of the most recently used HAT-files will be displayed at the bottom of the File menu.



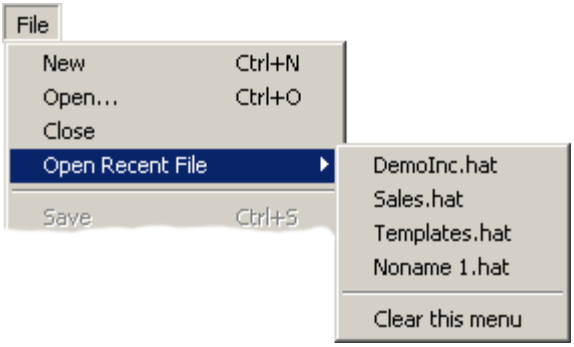
The number of file names is limited to a maximum of eight.

Full pathnames

If this entry is chosen, the file names will be displayed with the their full pathnames. Beware though, that depending on the used file structure, these pathnames can be very long.

In a submenu

An alternative way to display the list of recent files is to show it as a submenu, just below the Close command.



Note the command Clear recent files at the end of the file list, in case you would like to purge the list.

Files

Check for File Updates

When more than one user operate on the same HAT database, HAT will issue a warning if the database has been changed by another user. If you uncheck this box, these warnings will be suppressed.

System Setup

Associate File Types

HAT has a built-in functionality for making a quick and safe update of the Registry, via this button. If you press the button, the current version of HAT will be

opened when you double-click on a file icon of a file with one of the extensions .hat or .hax. The files will also appear with correct file symbols:

Extension	Symbol	File name example
.hat		DemoInc.hat
.hax		DemoInc.hax

For further details on the file formats in HAT, see section “Three file formats” on page 11.

MacOS
There is no need to establish file associations (the MacOS maintains the corresponding functionality without involving the user).

Register/Unregister OLE-Server

Use these buttons if you want to start/stop using the OLE services built into HAT. By default the OLE Server is active. Usually there is no reason to unregister the OLE-Server.

Web-HAT

Serve web clients

This setting is applicable only if the HAT program has Server functionality. By choosing this alternative, the HAT program can serve as a web server, i.e. a user/client can look at the installed templates from a web browser (IE Explorer, Netscape, etc).

Print…

Standard Windows command.

Printer Setup...

Standard Windows command.

MacOS
The command is called Page Setup...

Import Setups

Import Setups lets you specify how a text file should be interpreted when it is imported to HAT. Note that you need a HAT-processor of the Operator or Server types, to be able to import text files.

In the submenu of Import Setups, you have the options to create a new setup, delete an existing one, or activate one of the setups already installed (from the list below the commands).

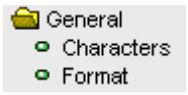
New Import Setup

Release the mouse button on this entry, and an empty setup will be created. If you make any change to this setup, and then close it, you will be asked if you want to add it to the list of setups. It will either get the name you have entered (see below) or HAT will automatically give it the name Import Setup 1 for the first setup, or append the first higher running number that is not already occupied.

Delete Import Setup

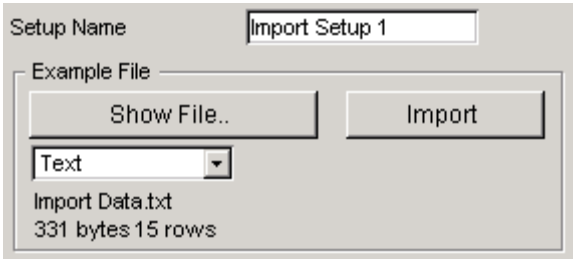
This command is only available for an active Import Setup, so in order to delete a setup, first activate it from the installed list.

Definition pages in Import Setup



General

General has settings of its own, in addition to the sub settings, in Characters and Format.



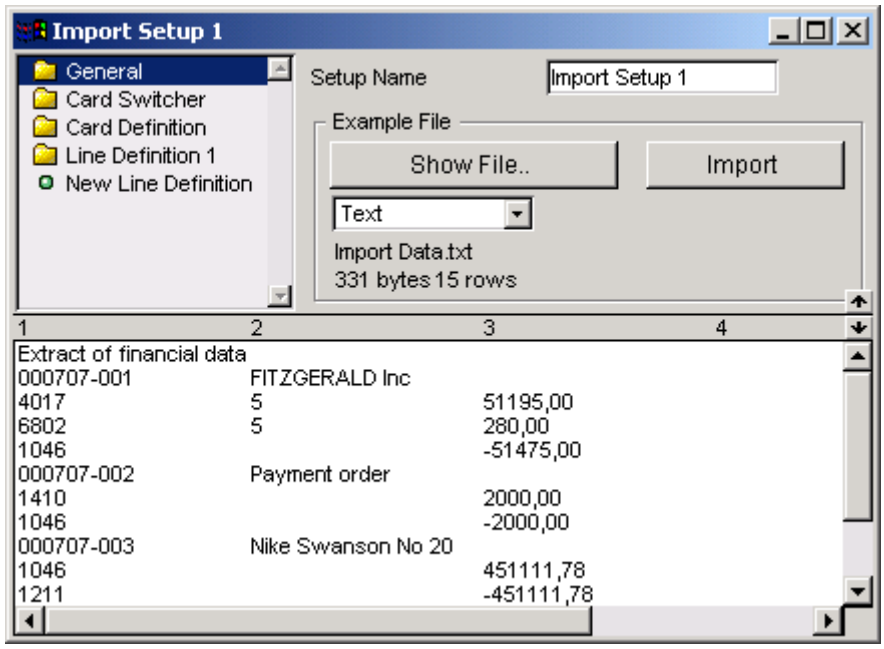
Import Setup Name

In this field you can give the Import Setup a name.

Show File

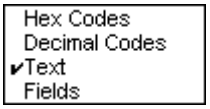
By clicking the Show File… button you will be able to select an example file. The file you choose should have the same format as the file you intend to import, or simply be this very file. Showing an Example File is not a necessary step in

order to define the setup, but it often is of great help, when filling in the rest of the setup.



Example files can be shown in three character formats (it is set to Text in the Import Setup above):

Hex Codes	Characters are displayed as hexadecimal codes
Decimal Codes	Characters displayed with decimal codes
Text	Text characters are displayed as usual



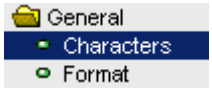
Some displayed characters may look the same, but have different codes. Use the Hex Codes or Decimal Codes formats to see their exact definitions.

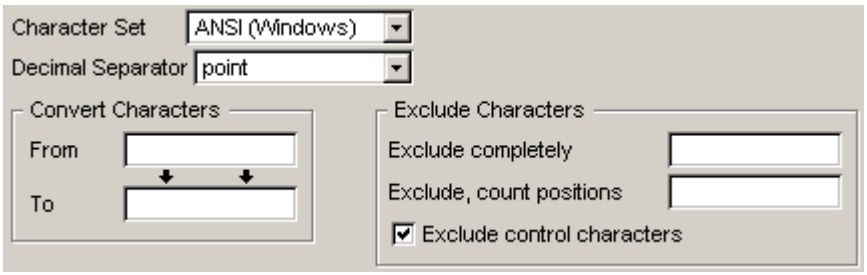
The fourth entry in the drop-down menu is Fields. When the pop-up is set to this value, the actual interpretation of the text file in terms HAT fields is displayed, according to the current settings of the Import Setup. Switch to this setting to check that other setting has been correct.

Import

This button is active only if an Example File has already been opened (by using Show File). The full Example File will then be imported. I.e. it is not possible to import another file using this command; for this purpose use the Import… command in the File menu.

General: Characters





Character Set

The imported file must be a text file. Depending on the computer which produced the file, different code tables are used. Choose the character code table used in the imported file.

If you are not certain which code table to use, it is easy to try different settings, provided you have already opened a text file, with Show File. The effect of a changed setting will show up instantly.

Convert Characters

These two edit-boxes define character conversions. A character in the upper box will be replaced by the character at the same position, in the lower box. E.g. with the following entries

every occurrence of the letter ”Ç” will be replaced by the letter ”c”, ”ü” by ”y”, and ”å” by ”a”. The effect of a changed setting will show up instantly.

Exclude Characters

Specify all characters that you want to exclude in these fields. The exclusion affects all imported fields.

Exclude completely. Characters entered here will be removed altogether, and their positions will not be taken into account when the position of a field is entered. It works as if the character had not existed at all in the file.

Exclude, count positions. The characters entered here will not be imported, but their positions are counted e.g. when defining the start of a field. In order to illustrate this, the corresponding positions are displayed as blanks, in the Show File window. But, again, note that they will not occur in the imported file.

Exclude control characters. The file from the host system often contains control characters which are of no use to other systems. But they may cause problems – they are often invisible when the file contents is presented as text, but are included in the character count, when defining the exact position of a field. By choosing to exclude these characters, they are neither displayed, nor included in the character count. It works in a similar way as Exclude completely. The difference is that all control characters are excluded as a group, and you do not have to specify them individually. The group of control characters consists of the first 31 characters in the ASCII code table (with decimal codes #01 ... #31).

Example

An example file could look like this, with the field length set to Fixed:

```
....x....1....x....2....x....3....x....4
Extract from the accounting file
.011011980701B0100009607
.011012SER. B: 1-10000:Turing Transport
.0110130000002110-0000000010482600
.0110130000047310 0000000010482600
.011011980701B0100019607
.011012SER. B: Turing Transport
.0110130000002110-0000000003688400
.0110130000047310 0000000003688400
```

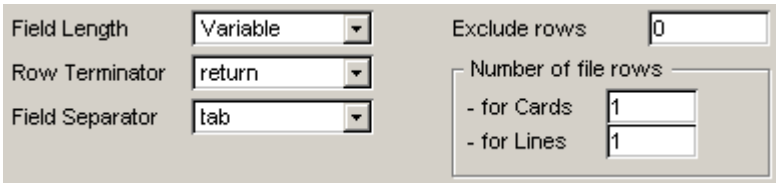
The dots at the beginning of each file row, each represents an unknown character. When the control characters are excluded, it looks like this:

```
....x....1....x....2....x....3....x....4
Extract from the accounting file
011011980701B0100009607
011012SER. B: 1-10000:Turing Transport
0110130000002110-0000000010482600
0110130000047310 0000000010482600
011011980701B0100019607
011012SER. B: Turing Transport
0110130000002110-0000000003688400
0110130000047310 0000000003688400
```

Decimal Separator

Defines the character separating the integer and decimal parts in value fields.

General: Format

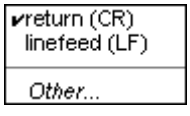


Field Length

Choose between fixed or variable field lengths.

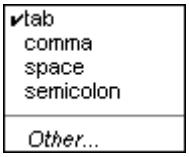
- Fixed fields are used if no character is acts as a field separator, i.e. fields are defined solely by their start and end positions, counted from the start of a file row.
- Variable fields are used if a field separator is present. In this case fields are defined by their field number. Occasionally only a part of such a field is relevant. This part can be further specified by assigning start and end positions within the field, when its field number has been defined (see below).

Row Terminator



Usually the characters ”Return” or ”Line feed” are used to define the end of a file row, but any character can be entered here.

You can use the entry *Other...* to specify a decimal code of another character. Then precede the decimal number with the #-character. E. g. #13 represents the same character as return, and #11 the same as line feed.



Field Separator

If variable field lengths are used, you have to enter the character that defines the border between consecutive fields. Very often ”Tab” is used as the field separator. With *Other...* you can define any character code (see preceding paragraph).

Exclude Rows

Text files often start with page headers, column titles, etc – file rows which are not relevant. The number in this box defines, the number of leading file rows that will be skipped at importation. The example file has one leading file row that is irrelevant:


```
....x....1....x....2....x....3....x....4
Extract from the accounting file
.011011980701B0100009607
.011012SER. B: 1-10000:Turing Transport
.0110130000002110-0000000010482600
.0110130000047310 0000000010482600
.011011980701B0100019607
.011012SER. B: Turing Transport
.0110130000002110-0000000003688400
.0110130000047310 0000000003688400
```

Enter ’1’ in the Exclude rows box, and you will get:


```
....x....1....x....2....x....3....x....4
Extract from the accounting file
.011011980701B0100009607
.011012SER. B: 1-10000:Turing Transport
.0110130000002110-0000000010482600
.0110130000047310 0000000010482600
.011011980701B0100019607
.011012SER. B: Turing Transport
.0110130000002110-0000000003688400
.0110130000047310 0000000003688400
```

The shaded area indicates that the first file row will be discarded, when importing the file.

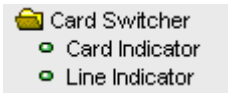
Number of file rows for Cards

Defines the number of rows the Card information occupy. Multiple file rows are mapped as if they were one single concatenated line. E.g. if Date and Card Title occur in two consecutive but separate file rows, specifying 2 here, makes them accessible as if they were in one single file row.

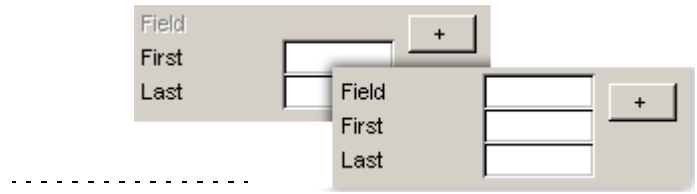
Number of file rows for Lines

Same as above, but refers to Lines instead of Cards.

Card Switcher



On these definition pages you describe how to divide file rows into Cards and Lines.



It looks different, depending on the setting of Field Length (see General: Format). This field definition can be used to group consecutive Lines, to form Cards. If a number of consecutive file rows have the same contents in the Card Switcher field, they will all be grouped in the same Card. When the contents changes, a new Card is generated. An empty field is regarded as unchanged.

Field definitions. The way in which fields are defined, is the same throughout the import format. In this particular case the definition page looks as follows (if Field Length is set to Variable):

You enter a field number in the Field box and, if applicable, First and Last positions within this field.

By pressing the plus (+) button, you create another set of entry boxes:

together with a plus and a minus button. The effect of filling in both sets of entry boxes, will be that the two fields that are defined are concatenated, and conceived as one combined field. This concatenation can be extended to any number of fields. Thus, if date is to be used as a Card switcher, and day, month, and year occurs in different parts of the file rows, you can ”pick” the date parts from their locations, and combine them here, to one single date.

When you press the minus button, the last column will disappear.

Card Switcher: Card Indicator

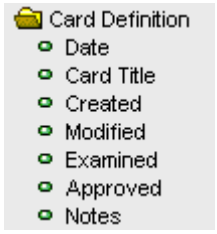
A file row for which the contents of this field exactly matches the characters in

the Indicator box, is considered as a row with Card data.

Card Switcher: Line Indicator

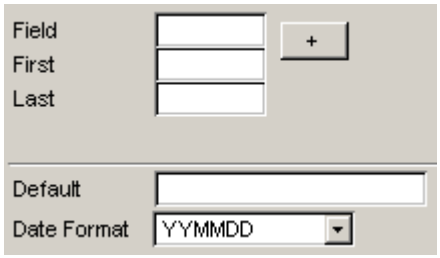
Corresponds to the Card Indicator, but defines a file row with Line data.

Card Definition



Card Definition: Date

On this definition page you enter the positions for the Card date.



You can also enter a Default value, e.g. a common date for all transactions imported in the same run. The default value will be entered into the HAT database if, and only if, there is no date value in the designated entry field.

Date Format. HAT can import a wide variety of different date formats, if only they are expressed numerically (i.e. '8' is accepted as a month, but 'August' is not). Generally Y stands for year, M for month, and D for day. They can be expressed and ordered in different ways. Any characters, but for numbers, act as separators between the date parts.

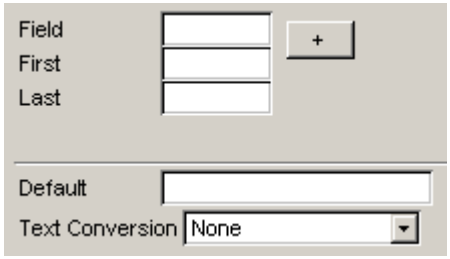
Each date part has two digits, in the indicated order. Years are stated with two digits. If the host file has 4-digit years, exclude the left most two positions to get rid of the century part.

The date parts occur in the indicated order. Years can be two or four digits. The parts are separated by any non-numerical character.

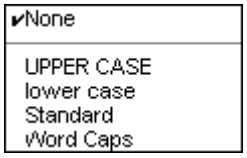
Date in HAT and the "millennium problem". Many host systems store the year with two digits only, which makes a date such as 02/11/25 (in the format YY/MM/DD) ambiguous. Should it be interpreted as 1902/11/25 or 2002/11/25? HAT solves the problem in this way:

- All short format dates in the interval 28/01/01 - 99/12/31 are mapped on the dates 1928/01/01 - 1999/12/31
- All other dates, i.e. 00/01/01 - 27/12/31 are mapped on the dates 2000/01/01 - 2027/12/31

Card Definition: Card Title and Notes



You have the option to convert the texts in these fields during importation, by choosing from the following list of alternatives:



The conversion will be performed exactly as indicated by the spelling in the drop-down menu, i.e.

Imported string	UPPER CASE	lower case	Standard	Word Caps
This is a STRING	THIS IS A STRING	this is a string	This is a string	This Is A String

Card Definition: Other Card Fields

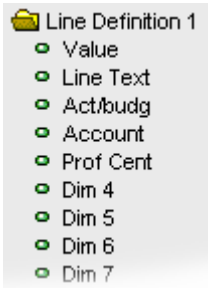
Created, Modified, Examined, and Approved are all treated in the same way as Card Title/Notes, with the minor difference that the Text Conversion operation is not available for these fields.

Line Definitions

Single or multiple value types in the file

In the simplest case there is only one type of value in the file, e g an accounting file which only has dollar values. This case is very straight-forward from an importation point of view.

But often you have a number of different value types in the same file, e.g. number of sold units, their dollar sales value, etc. These values can occur in the import file in different ways, too. This will be further explained in the following paragraphs.



Introduction – Single versus Multiple Line Fields

The transaction values can occur in the imported file in two different ways:

1. Transaction values are placed in one single position in the file rows (i.e. corresponding to one column).
   Example:

…	100	NO	Number of units	…
…	35	DS	Dollar Sales Value	…
…	25	DC	Dollar Cost	…

…	250	NO	…etc.	…
…	38	DS	…	…
…	21	DC	…	…
…	430	NO	…	…

FIGURE 1. *Single value column structure, only needs one Line Fields entry*

2. Each file row has many value fields. E.g. a matrix with three value columns: number of units, sales (in $), and product costs (in $).

…	NO	DS	DC	…
…	100	35	25	…
…	250	38	21	…
…	430	…	…	…
…	…	…	…	…

FIGURE 2. *Multiple value columns structure*

This *multiple value columns structure* can be imported into two different structures in HAT. These two structures each have their distinct advantages. The differences are explained further below (see section “Multiple value columns structure” on page 42.). Note that these fields/columns do not necessarily have to be adjacent to each other, as they are in the illustration above.

The case of a single value column is described first, followed by a generalization to multiple value columns.

Specifying the Line Fields

In the case of Demo Inc, the following fields have to be specified:

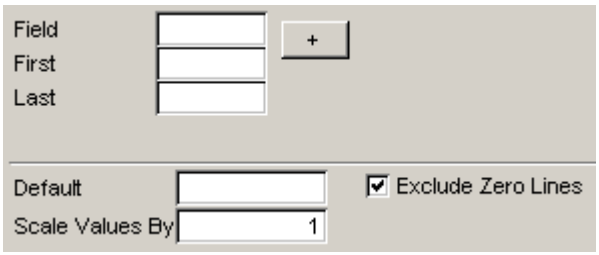
Value, Line Text

and each of the dimensions:

Act/Budg, Account, and Prof Centr

The settings generally are very similar to the corresponding Cards Fields settings. Only the ones that differ, will be commented here.

Line Definition: Value



Scale Values By. Some accounting software express all values in cents (i.e. skips the decimal point). HAT will multiply all imported transaction values with the factor in the Scale Value By box.
If you want to convert cents to dollars, insert the value ’0.01’, to get the desired

result.
Another use of this feature, is to make currency conversions already at the importation stage.

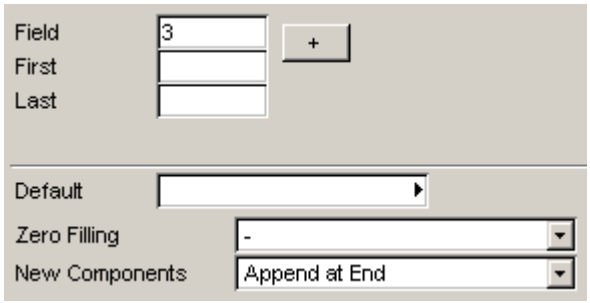
Exclude Zero Lines. Fill this in, and the corresponding Lines will not be entered into the HAT database.

Line Definition: Line Text

See corresponding entries for Card Definition, above (“Card Definition: Card Title and Notes” on page 39).

Line Definition: Dimension components

The field position of e.g. the Account host codes has to be defined:



Default. Use this to enter a dimension component that will be common to all imported file rows. E.g. the whole file may contain only Actuals in the first dimension, without this being expressed anywhere in the file (probably not, in fact). The pop-up arrow to the right in the box, allows you to see the whole dimension chart, and enter one of its components:

Zero Filling. At times the codes to be imported have one or more leading zeroes, e.g. the host codes of the accounts will in the dimension chart have the following format:

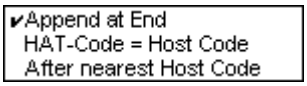
001
023
085
224

A data file with host codes like this may after having passed through a number of “smart “ software become stripped of all the leading zeroes. E.g. if you open the text file in Excel, without being careful, you may end up with the following codes:

1
23
85
224

A simple way to fix this in HAT is to set Zero Filling to 3:

The values in the Host Code fields will then be filled with leading zeroes, so every host code field value will occupy three positions, and be correctly interpreted at importation.



New Components. Determines what happens when HAT encounters a host code that is not included in the dimension chart.

Append at End	Unknown components will be placed at the end of the chart, with HAT-Codes #00001, #00002 etc. The group will have the character # as HAT-Code, and New components as text.
HAT-Code=Host Code	A new component will be appended to the existing ones, and its HAT-Code will be identical to the Host Code.
After nearest Host Code	The component will be positioned as the last element, in the group that has the closest Host Code of a higher rank.

Multiple value columns structure

It has already been mentioned that data which contain many values in each file row (see Figure 2 on page 40) can be represented in two fundamentally different ways in HAT. This will now be further explained.

Multiple value fields or multiple line fields?

The two ways to represent multi-column data are as follows:

Method 1. A single Line in HAT can contain up to 24 different value fields, i.e. in effect as many as you reasonably need. If you have host data with a multiple value columns structure, the most straightforward way to structure data in HAT is to set the number of value fields (this is done in Database Settings..., in the Database menu) to the number of value columns in the host file. Each Line in the HAT database will then contain a number of value fields, like this:

		Value Fields				
	Actual/budg	Account	NO	DS	DC	Prof Cent
Line 1	Actual	1010	100	35	25	3
Line 2	Actual	2036	250	38	21	5
Line 3	Actual	8110	430	29	…	1
…	…	…	…	…	…	…

Method 2. The other way to do it, is to use an ordinary dimension as representing *Value Types*. A file row with many value columns is then represented by the same number of Lines in HAT. This means that a file row with three different value columns, as in the example above, will be converted to three different Line

entries in HAT. This may seem to be an unnecessarily complicated way to create a HAT application. But it sometimes has clear advantages. The end result in HAT will look like this:

	Actual/budg	Account	Value	Value Type	Prof Cent
Line 1	Actual	1010	100	NO	3
Line 2	Actual	2036	35	DS	3
Line 3	Actual	8110	25	DC	3
Line 4	Actual	2036	250	NO	5
Line 5	Actual	2036	38	DS	5
Line 6	Actual	2036	21	DC	5
Line 7	Actual	8110	430	NO	1
Line 8	Actual	8110	29	DS	1
…	…	…	…	…	…

This is an example of a dimension chart for these value types:

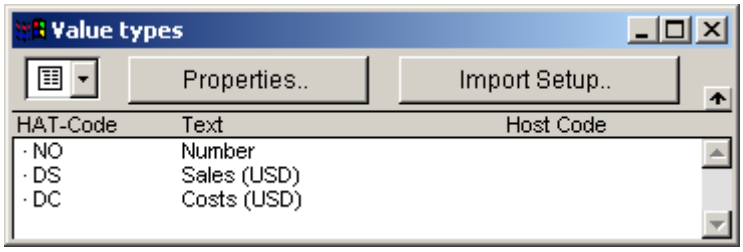


FIGURE 3. *Dimension chart for Value Types*

Which structure is the best? A major consideration for choosing one structure before the other, has to do with RAM requirements.

If there are many columns of data, and almost all of the cells are filled with values, i. e. non-empty (sometimes called the “dense matrix” case), using the natural structure with many values for each Line will clearly use less RAM.

In the opposite case, when many entries in the host data value columns are empty (the “sparse matrix” case), the multiple Lines structure may be more efficient.

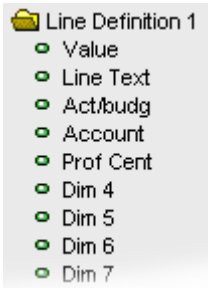
It is difficult to establish a clear cut rule for determining which is best in individual cases; a practical test with importing actual data into two different HATs, with different structures, gives the best answer.

Besides RAM requirements there are more qualitative aspects to consider:

- Many value fields per Line, opens for the opportunity to easily define new, calculated value fields, at a later stage (see Database: Transformation for further details)
- Using multiple line value fields, on the other hand, can benefit from the richer structure of a dimension chart; e.g. if “dollar-costs” and “dollar-revenues” are two different value types in this type of structure, they can be hie-

rarchically subordinated to a higher level component “dollar-profit”. It is thus possible to display first the dollar-profit, and then unfold it to see the underlying components, in an intuitive and simple way.

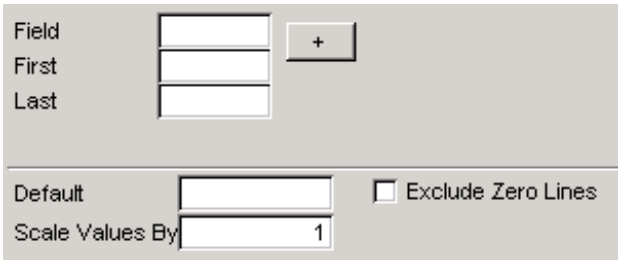
Import Setups for the two multiple value structures



Multiple value fields per Line. This case is the easiest, both to understand and to implement. In the case of a single value column in the imported data, the first field in the list was Value. This list is now extended with all valid value fields. They are,

No, Sales, and Costs

Their names are defined in the Database Settings. The definition pages for each of them is exactly the same as in the single value case:



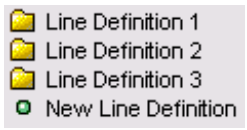
Note that if the Exclude Zero Lines is marked, the Line will be skipped only if *all* the value fields have zero values (or are empty).

Multiple Lines per file row. This case is here illustrated with the three value types, already used in the example. The dimension chart for this case is shown in Figure 3 on page 43.

The components correspond to one value each – the columns NO, DS, and DC, in the host data matrix:

…	NO	DS	DC	…
…	100	35	25	…
…	250	38	21	…
…	430	29	…	…
…	…	…	…	…

When importing a file row like this, HAT converts it into three different Lines. It works as if HAT read the same file row three times over – one time for each value type. Thus, you have to define three different Lines: Line Definition 1, Line Definition 2, and Line Definition 3, one for each value type. The first is always present, so you have to create the two additional ones, with the command New Line Definition, to get the following set of fields:



Each of these is filled in as a single value entry (see “Specifying the Line Fields” on page 40).

Only two entries differ in the three Line Definitions – the positions of the fields containing the transaction values, and their default component values. All the other entries have to be entered three times over.

To simplify this unnecessarily tedious task, use the Duplicate Line Definition command. When the first Line Definition 1 has been completed, focus on the Line Definition 1 entry, and choose Duplicate Line Definition 1 from the Edit menu, or simply press Ctrl-D. Then change it to the correct file row position for the second value type, and also its default component. Repeat this procedure to for Line Definition 3, and you will not only save time, but also minimize the risk of making mistakes.

Import…

Will import either of

- a text file with transactions data; in this case an import setup window has to be active
- a complete HAT-file or sections of a HAT-file (e.g. the section containing only the analysis templates)
- a dimension chart or a time scale stored as a text file.

Note that in order to import a dimension chart or a time scale, a window of any of these types has to be active. See page 57ff for Dimension Charts, and page 89ff for Time Scales

Export…

You can export an analysis result (table or chart) as a file. This menu command is functionally less versatile than the corresponding function on the Export definition page, in each analysis template. See “Export” on page 121.

You can also export the contents of an open and active dimension chart or time scales window.

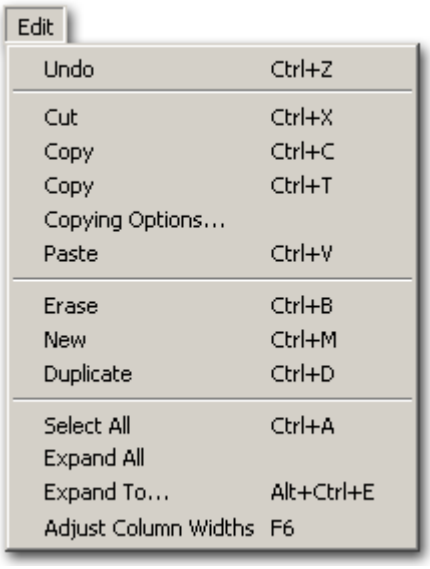
Exit

Will terminate the active HAT program. If the HAT database has been changed during the analysis session, you will get a warning message.

MacOS
The corresponding command is Quit

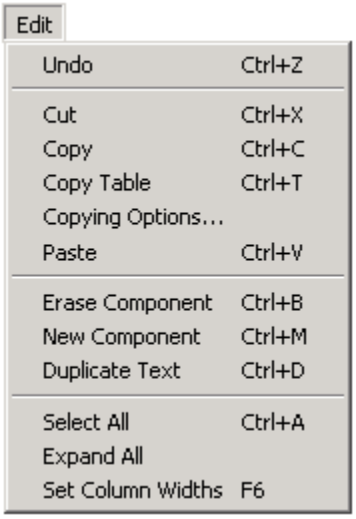
4

The Edit Menu



Introduction

Many of the Edit menu elements in HAT are standard operating systems commands. You are supposed to be familiar with them, and they will



not be explained further here. Some of the commands are specific for HAT and their names and functions will vary depending on the current state of HAT.

If a command is disabled, it of course has no function.

Commands in the Edit Menu

The commands look somewhat different depending on what element is focused. If a part of a text string is marked, the Cut command is changed to Cut Text, but if a selection is in focus, it is instead displayed as Cut Selection. In an analysis template you can see what element is in focus, either as highlighted text or as an element with a dotted border:

Important hint

You have to focus a field, to get access to the corresponding edit command. The copy command has a broad use – you can not only copy data, but also full tables with data, and selection definitions (including clusters of selections and variables). The copy command is often very useful, but it always requires that the element (which may include a large number of sub elements) in question is ‘in focus’ which is indicated by the dotted border.

Cut

Cut is equivalent to Copy followed by Erase. In Component Functions and Time Functions this command changes to Cut Selection or Cut Formula, when a selection or a formula is focused. If a local subset is in focus, the Cut command accordingly changes to Cut Subset. It is not possible to cut a variable in Com-

ponent Functions or Time Functions, if the variable is used in a formula. Neither is it possible to cut the last selection from a template, as each template by default always has at least one selection.

Copy

Copy will change to Copy Text, Copy Selection, Copy Formula or Copy Subset with the same functionality as Cut, but it will not remove the original contents.

If the Variables pop-up is in focus in a Time Functions or Component Functions template, it changes to Copy Variables. You can then, collectively, paste all variables into a another multi-variable template. All the variable attributes are transferred to the new template – e.g. if one of the variables was not shown when it was copied, it will not be shown in the new context either.

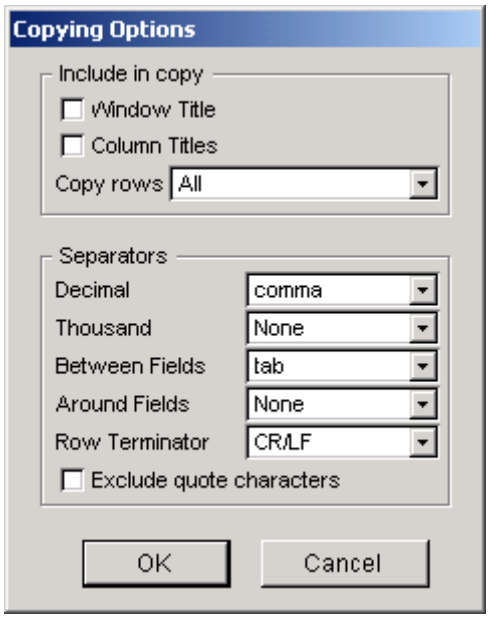
Note that local subset names are not copied, only global subset names. This is a natural consequence of the fact, that local subsets can only be referred to within the template for which it is defined. Global subsets, in contrast, are valid for all templates, i.e. they can also be copied and pasted between templates.

Copy Table.../Copying Options...

Copy Table will copy the full table (the whole list of results in an analysis) and Copy Chart will copy a chart, depending on the presentation mode in the current analysis window. Note that if you have marked only a part of a full table, you have to use the option Copy Text, if you do not want to copy the full table. Copy Table/Chart is useful when you want to enter results from HAT into another application, e.g. Excel. It is often a convenient alternative to the Export option. Copy Table… can also be used to copy the contents in a dimension chart, or a user defined time scale.

Copying Options...

Every time you use the Copy command, HAT will check what Copying Options you have specified:



Include in copy. Allows you to specify what parts of header texts you would like to include in the copy. In Copy rows you can limit the volume of rows that are copied, e.g. to avoid to copy all in a very large HAT template.

Separators. You can determine how the copied fields are stored on the clipboard. When you try to copy large numbers which have a separator to indicate thousand positions, HAT can use the separator used by the Windows system, which is ”hard space”; but if these numbers are pasted into Excel, the hard space will make Excel interpret the whole number as a text string. By setting Thousand to None, you avoid this potential problem.

Quote characters can sometimes cause trouble when the copied text is pasted into an Excel worksheet, as Excel give quotes a high priority when trying to group data in a meaningful way. E.g. if the text copied contains only one quote character, the interpretation can lead to queer results. The problem is often solved by excluding these quotes (single or double) altogether.

Paste

In a text entry box this command appears as Paste Text. You can also paste a selection, a formula or a subset with the commands Paste Selection, Paste Formula, or Paste Subset, depending on where the focus is. Paste Variables works in Time Functions and Component Functions, where it pastes a whole set of variables (selections and formulas) in one step.

Erase

When you mark a set of characters anywhere in a text entry box, this command will change to Erase Text. You can also erase a selection, a formula, a local

subset, or a component with the commands Erase Selection, Erase Formula, Erase Subset, or Erase Component, respectively.

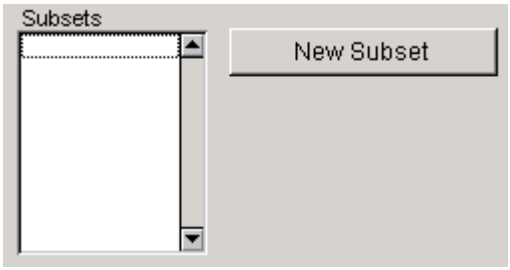
New

The functionality of this command also depends on the current context.

New Selection and New Formula creates a new selection or formula in Time Functions or Component Functions.

New Component produces a new (empty) component in a dimension chart.

With New Subset a subset is added to the (possibly empty) list of local subsets (i.e. subsets defined ”within” an analysis template). Note that you have to focus the entire frame around the list of local subsets, for this command to be available in the menu. A click anywhere in the list will achieve this:



But you can of course always click the button New Selection, to get the same effect in a simpler way.

Duplicate

Works with selections, formulas, line fields, and subsets. Duplicate Selection copies the selection which is in focus, and adds it to the list of selections. It will get the same contents as the one duplicated. Duplicate Formula and Duplicate Subset works in the same way

Select All

Works with fields containing texts. Highlights all the text in which the cursor is positioned.

Expand All

Expands all components in a dimension structure – in a dimension chart or an analysis template of types Components or Component Functions.

Expand to...

Allows you to specify how many levels should be expanded in a Components och or a Component Functions template.

Set Column Widths

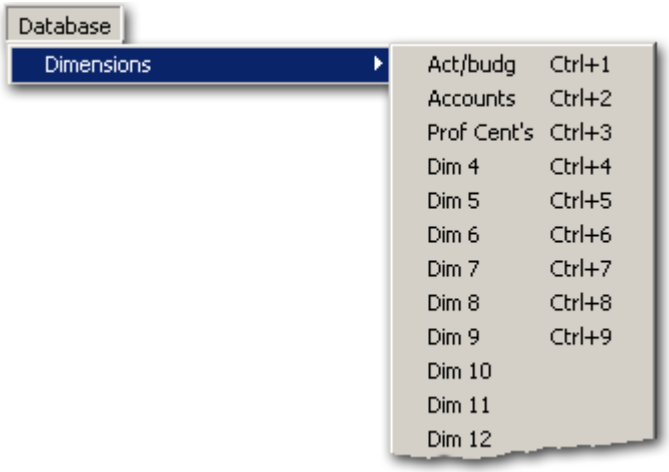
You can set column widths individually, either by dragging with the mouse or by double clicking with the column adjustment tool ( ) active, see section “Value fit and column width adjustment” on page 117.

If there are many columns to adjust, you can use this command instead. When invoked, it will give all columns in the current template, dimension chart, or other relevant window, an optimized length. You can also use F6, as a shortcut.

5

The Database Menu

Dimensions



Introduction

The dimension concept is explained on an introductory level in Chapter 2: General about HAT. See “Dimensions” on page 9.

In this chapter you will find more details on exactly how a dimension is organized, how you can update it, make changes to it, etc.

Basic Concepts

Components in a Dimension Chart

We use a chart of accounts to illustrate these concepts.

A chart of accounts usually has at least two types of elements

- *account numbers*,
- *account names*, which describes what the account number is all about.

The accounts are often, but not always, ordered hierarchically in the host system. E.g. as in this example:

Name	Code
Labour costs	50
Payroll	501
Wages	5011
Monthly wages	50111
Piece-work rate	50112
Salaries	5102
Social security	502
…etc…	…

Labour costs consist of Payroll and Social security costs. Payroll costs, in turn, are split into Wages and Salaries; and Wages are split into Monthly wages, Piece-work rate, etc.

In HAT these accounts typically constitute a *Dimension chart*, probably called ”Accounts”. But there are many other examples of structures in different host systems that benefit from being represented as dimensions in HAT, such as products, customers, suppliers, projects, company units, employees, geographic areas – a list of such examples could be made very long. Each entry in a Dimension chart is generically called a *component* or *dimension component*, in HAT.

HAT-Code, Text and Host Code

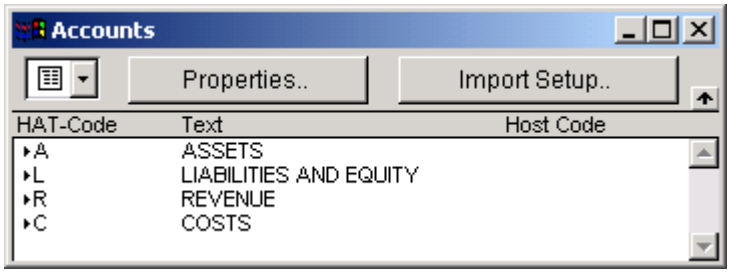
In a HAT dimension chart, the account name is found in the column Text, and the account code in the column Host Code. In addition to these, a HAT dimension component always has a HAT-Code:

HAT-Code	Text	Host Code
▾A	Labour costs	50
▾AA	Payroll	501
▾AAA	Wages	5011
· AAAA	Monthly wages	50111
· AAAB	Piece-work rate	50112
· AAB	Salaries	5012
· AB	Social security	502

The HAT-Code gives the user full flexibility to change the hierarchical structure of a dimension chart at any time. The HAT-Code is the only entry in a dimension chart that is mandatory – Text and Host Code are both optional.

Viewing a dimension chart

The Accounts dimension in Demo Inc serves as an example:



A dimension chart can be inspected by expanding any component into its sub components. The reverse operation is collapsing the sub components. To understand the status of each component you are guided by the hierarchy symbols. Here illustrated by the small pop-up arrows to the left of the HAT-Code. You can choose between three different sets of symbols by setting the menu element :

- Hierarchies without indentation
- Arrow presentation
- Explorer presentation

Hierarchy symbols

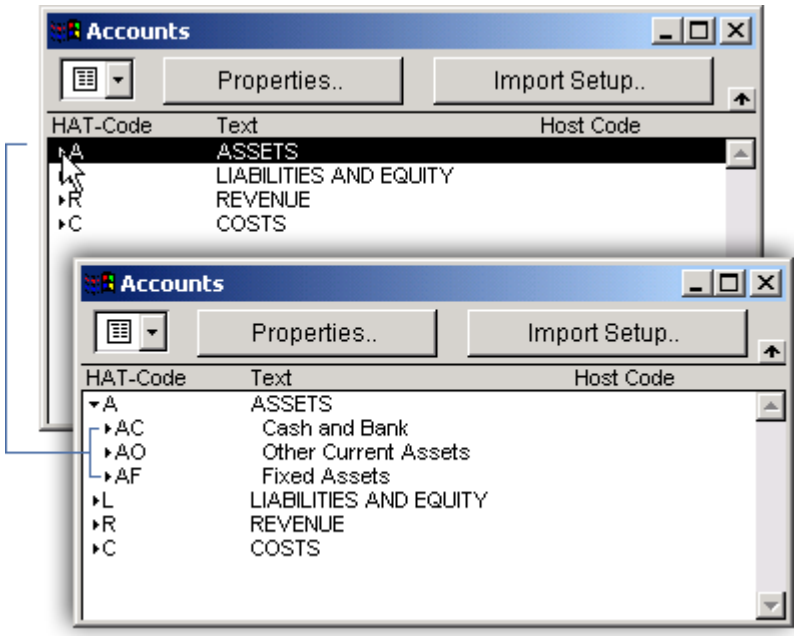
If the setting is without indentation, the hierarchy symbols are +, >, and space:

The arrow and explorer presentations are analogous:

Presentation			
Without indentation	**Arrows**	**Explorer**	**Explanation**
+CL	▸CL	⊞ CL	The component has sub-components and can be expanded
›CLW	▾CLW	⊟ CLW	The component has been expanded
CLW5007	· CLW5007	- CLW5007	This component is at the bottom of the hierarchy. It has no subcomponents and cannot be expanded

Expand a component with the mouse

A single click on the hierarchy symbol (▸) expands the component to the next level:



Another click on the symbol for expanded hierarchy (▾), collapses it again (▸).

Expand all sub components

Double click on a component to expand all sub components. Other components are not affected.

Expand all the components

While the dimension chart is active, use the menu command Expand All, in the Edit menu.

Expanding/collapsing with the keyboard

Enter Alt+Enter	The key equivalent of a single click is the Enter key. If the insertion point is located in a collapsed component, the Enter key will expand the component. If the insertion point is located in an expanded component, the Enter key will collapse the component. Alt+Enter will expand all components.

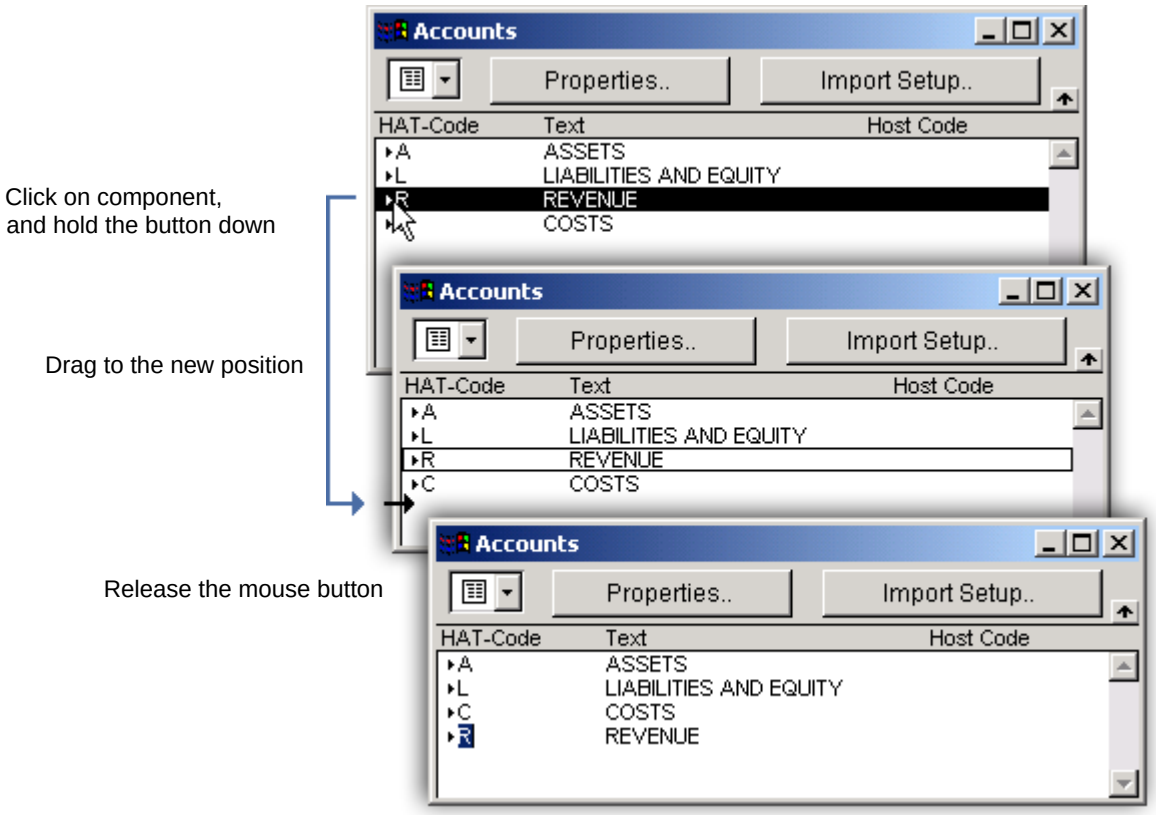
Changing structures

An existing dimension chart can be modified in many ways, one of which is moving components from one position in the hierarchical structure to another.

Any sub components arranged under a component are moved along with this component.

Moving components with the mouse

You move a component simply by dragging it to a new position in the dimension chart. The following sequence shows how to drag a component to a parallel position



You can also move a component ”horizontally”, to another hierarchical level. If you move the component slightly to the right, the horizontal arrow will be tilted (↘). This is to show, that it will now be entered as a sub component.

The HAT-Code will be adjusted accordingly.

Moving components with the keyboard

Ctrl+ Arrow up
Ctrl+ Arrow down

Moves a selected component up or down in the expanded region of the dimension chart.

Ctrl + Arrow left
Ctrl + Arrow right

Moves a selected component, to make it a sub component/parallel component to the one on the line above.

Adding components

Sometimes, you may want to define a new component, e.g. to define a new group of sub components.

There are several ways to add components:

1. Adding components by editing.
   The New component command in the Edit menu inserts an empty line in the dimension chart. HAT will suggest a code. Duplicate codes are not permitted.
   The keyboard equivalent for New Component is the Return key.
2. Adding components by importation.
   If you want to add many components, it is often more convenient to use the Import command. The imported table may be created in a word processor, spread sheet application, or produced directly from your host system.
3. Coding of new components.
   Often, a hierarchical structure of a dimension will be provided by the host system. You can restructure the dimension chart in HAT and create new "branches". The HAT code you enter for new components should be as short and simple as possible. When you subsequently move the component to its place in the hierarchy, HAT may suggest a longer code which reflects its position in the hierarchical structure.

Example

The new account, Travel grants, is given the preliminary code T. When it is moved to CLO Other empl expenses, it will be given the new code CLOT Travel grants.

Deleting components

You can delete a component from the dimension chart only if it is not currently active, i.e. if there are no Lines in the database which use the component or any of its sub components.

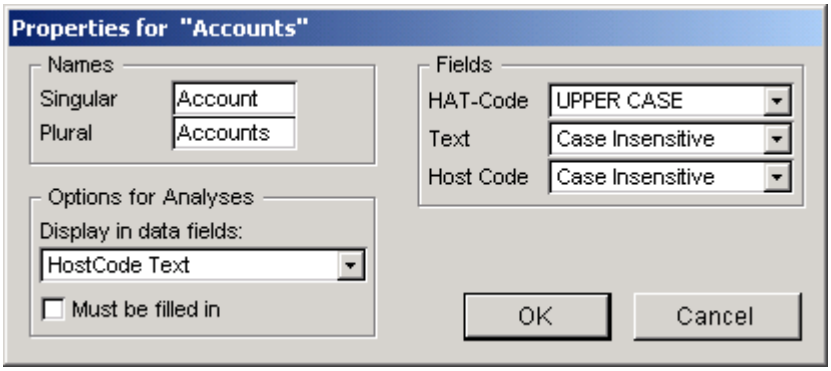
When a component is deleted, all of its sub components will be deleted as well.

There are two ways to delete components:

1. The Clear Component command in the Edit menu deletes the component at the insertion point. The corresponding keyboard command is Ctrl-B.
2. You can delete all components which are not currently active, used, or all of them, by saving the HAT database to a file with the Save Special command, with the options Active, Used, or None selected.

Properties

Click the Properties button to set the dimension names, how dimension components are displayed, and how the fields are formatted when data are entered.



Names

The name of the dimension, in singular and plural forms.

The singular form will appear in all analyses, and the plural form in all other contexts.

Options for Analyses

Display in data fields. Dimension names are “labels” for the dimensions. They do not affect the data, but are displayed in menus, window name lists, analysis templates, import setups, etc.

Display in analyses data fields, lets you decide which codes and/or text that should be displayed for each component in the analyses.

Example These examples span the whole range of possibilities to display a component with HAT-Code CVF, text FUELS, and host code 4010:

Selection in drop-down menu	Presentation in analyses
HAT-Code	CVF
HostCode	4010
Text	FUELS
HAT-Code Text	CVF FUELS
HostCode Text	4010 FUELS
HAT-Code Host-Code	CVF 4010
HAT-Code Host-Code Text	CVF 4010 FUELS

Must be filled in. Tick this entry if you want to enforce that at least one component has to be entered in a the corresponding dimension box, in a selection. If not, the template will not be calculated.

Example Use it when one dimension is Value Type, which has number of units and dollar values in it. If calculated without an entry in the corresponding dimension box, you would get the sums of number of units and dollar values. This is obviously meaningless, and potentially misleading.

Fields

Converts case settings in the database. When a HAT-Code, Text, or a Host Code is imported or entered, it will be converted as specified. You can also specify whether search in HAT-Codes will be case sensitive or not.

HAT-Code.

UPPER CASE	All characters will be upper case
lower case	All characters will be lower case
Case Sensitive	Search in HAT-Codes will be case sensitive
Case Insensitive	Search in HAT-Codes will be case insensitive

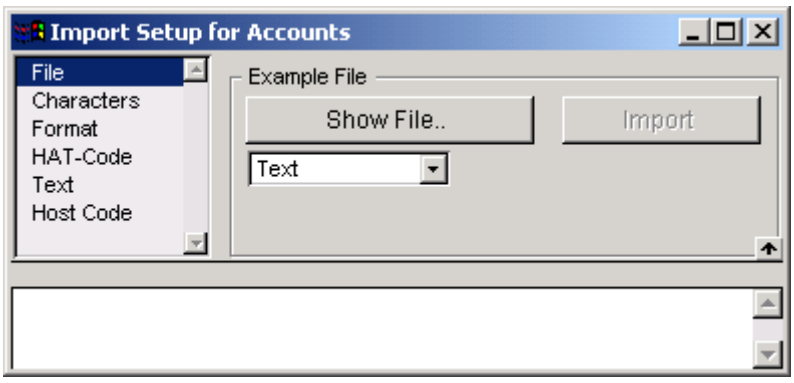
Text and Host Code.

Standard	The first character will be upper case
Word Caps	The first character of each word will be upper case
Case Insensitive	No conversion will take place

The alternatives Standard and Word Caps are not valid for HAT-Codes. Space characters are not allowed in a HAT-Code.

Import Setup ...

The Import Setup for dimension charts is rather similar to the one for importing transaction data. But it is generally simpler and has some features that are only relevant for dimension charts. There is one, and only one, Import Setup for each dimension chart. If you press the Import Setup button, you will get this window:



If you have made any changes, e.g. new settings, and closes the window, HAT will ask you if you want to change the import setup.

Definition pages

The menu in the page panel to the left activates the different definition pages, File, Characters, etc.

File

The first page has three groups of settings.

Show file

Click on the button Show File .. to be able to navigate to an example file with the same format as the file you will import. The example file can of course be, and often is, the same file as the one you intend to import.

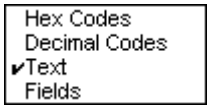
It is not necessary to show the import file in order to define an import format, but it makes it much easier to define it correctly.

You also have the option to import a dimension file directly “to the dimension window”, without using any visual aid. Just activate the dimension chart window and choose the Import .. command in the File menu. This import command will then change to e.g. Import Accounts .. if the dimension chart is a chart of accounts. The last defined Import Setup will then be used.

If you use the button Import to do the final importation, you first have to display the file with Show File.

Import

Use the button Import when all necessary settings have been done, and the dimension file will be imported.



Character display

Example files can be displayed using three different character formats:

Hex Codes	Characters displayed as hexadecimal codes
Decimal Codes	Characters displayed as decimal codes
Text	Text characters are displayed in the usual way

Some characters look similar or identical, but may have different underlying codes. Use Hex Codes or Decimal Codes to display their exact definitions.

The fourth choice in this drop-down menu is Fields:

Fields	Show how file rows are actually interpreted, using the current import settings

Data columns which are not used, will not be displayed at all, and the columns which are used will be displayed with the headings defined by the import settings. Use it to get a quick, final, check that the import format has been defined correctly, before doing the actual importation.

Characters

The imported files are always text files. But two text files that on the surface look identical, can be based on different code systems. With proper character settings different files from a multitude of sources can be imported, and along the way be cleaned up and transformed to suit the HAT application at hand.

Character Set

At times it can be difficult to get information on which character set that is used in a file.

If a file has been opened with Show File, it is in practice easy to decide which character set use. Just show the file as Text, and test different settings. You will instantly see how different choices of character sets will affect the texts displayed. When it looks reasonable, this character set is most probably the one to use.

Character Conversions

The two fields are used for character conversion. A character in the first box will be replaced with characters will be replaced with the corresponding character in the second box. E.g. all instances of the character ”Ç” will be replaced by ”c”, ”ü” by ”y”, and ”å” by ”a”. The conversion will take place instantly in the example file window, so it is easy to check that it works as intended. .

Exclude Chars

Enter all characters you want to exclude from the importation. The exclusion affects all fields.

Note! Excluded characters will be replaced by blanks.

Format

Choose between Fixed or Variable field length.

- Fixed Field Length should be used if no special character is used to separate fields in the text file. The fields are defined only by their first and last positions in the file row.
- Variable Field Length is used if there is a special character that is used as a field separator. The Tab character is probably the most commonly used (e.g. in text files produced by Excel), but the semicolon character and a few other are also common. When variable field length is used, a field can be defined by its ordinal number (field number). In some cases only a certain part of the field is relevant. You can then set the start and end position within the field.

Control Characters

Row Terminator. Usually the code for carriage return or line feed is used to indicate the end of a file row (row terminator), but in some cases other characters may be used. In such a case the entry Other ... can be used to specify a decimal ASCII code as the row terminator. It should then be preceded by the #-character. E.g. the character #13 is the same as return.

Field Separator. If variable field length is used, you have to define what character separates two adjacent fields from each other. Tab is often used. With Other ... another character code may be used, in the same way as for the row terminator (see the preceding paragraph)

Exclude other control characters. It happens that a file from the host system contains control characters that has no function outside this system. But they can cause troubles during importation – often they are invisible when the file contents is displayed as text, but they still occupy one position when you try

define the exact positions in a field. It is usually wise to use this opportunity to disregard them altogether.

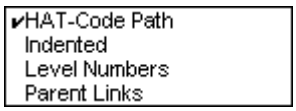
Exclude rows

Text files often starts with a few rows containing headers etc, which are useful for understanding what types of data there are in the columns. But they should not be imported, of course. Here you can enter the number of initial lines to skip during importation. The lines are still visible, but they are displayed on a grey background to indicate that they will not be imported.

Hierarchy

The simplest way to create a dimension chart of some magnitude, is often to edit a text file outside HAT, with HAT-Codes, Texts, and Host Codes already in place before importation. This file can then be imported to an active dimension chart window, using the Import … command in the File menu.

One reason to do it outside of HAT, is that it can be cumbersome to get the hierarchy as you want it. There is always the option to edit it “by hand”, but if there are thousands of dimension components this can be awkward, of course. In some cases the data has such a structure, that you can use HATs built in tools to get the hierarchy you want.
Some practical examples best illustrates the different importation tools.

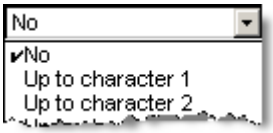


HAT-Code Path.

Example: The text file below consists of a few lines of accounts data. Only accounts at the lowest (four-digit) level are included in this case:

1010	Cash	1010
1050	Bank	1050
1400	Misc short debt	1400
1470	VAT	1470
1800	Computers & Office equipm	1800
1820	Office equipm	1820
1829	Depreciation, Office equipm	1829

HAT-Code Path combined with Create parent components. On the next definition page, HAT-Code, you have the option to create new hierarchical levels based on the four-digit code:



If set to ”No”, no new levels will be introduced and the dimension chart will look exactly the same as in the file imported.

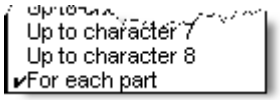
Character based hierarchical levels

If we choose Up to character 4, a hierarchy with four levels will be created:

HAT-Code	Text	Host Code
1		
10		
101		
1010	Cash	1010
105		
1050	Bank	1050
14		
140		
1400	Misc short debt	1400
147		
1470	VAT	1470
18		
180		
1800	Computers & Office equipm	1800
182		
1820	Office equipm	1820
1829	Depreciation, Office equipm	1829

There are no texts in the Text fields for the high level components, they have to be entered by hand.

Field based hierarchical levels



At the bottom of the drop down menu Create parent components, there is the choice For each part.

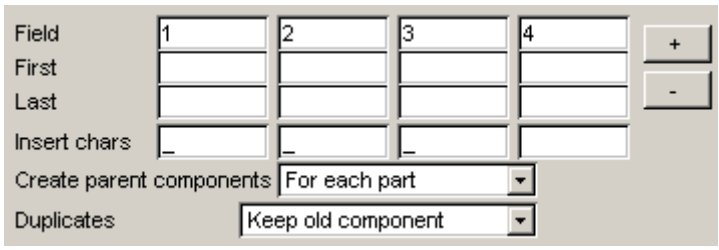
If input data has the following structure, we may conclude that we get a suitable

Chocolate	Mars	Big	1-pack	1001
Chocolate	Mars	Big	2-pack	1002
Chocolate	Mars	Big	5-pack	1003
Chocolate	Mars	Mini	1-pack	1004
Chocolate	Mars	Mini	2-pack	1005
Chocolate	Mars	Small	1-pack	1006
Chocolate	Bounty	Big	1-pack	1007
Chocolate	Bounty	Small	2-pack	1008
Chocolate	Bounty	Maxi	1-pack	1009
Chocolate	Bounty	Maxi	2-pack	1010
Snacks	Pringle	Big	1-pack	1011
Snacks	Pringle	Big	2-pack	1012
Snacks	Pringle	Big	5-pack	1013
Snacks	Pringle	Mini	1-pack	1014
Snacks	Pringle	Mini	2-pack	1015
Snacks	Pringle	Small	1-pack	1016
Snacks	Pringle	Small	2-pack	1017
Snacks	Pringle	Small	5-pack	1018

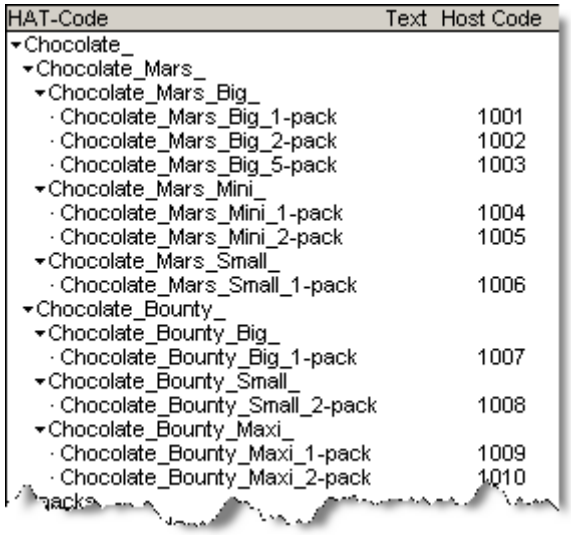
hierarchy by letting each column (field) become one hierarchical level.

By entering the following settings for HAT-Code, each column will create one level, at importation:

Between the concatenated strings are underline characters inserted, and the



resulting dimension chart looks like this::



In this case the texts for all levels are already in place.

Producing the hierarchy directly from the host system. is often the best alternative. It may. be readily available from the host system in a standard report:

1	ASSETS	1
10	CASH AND BANK	10
101	Cash accounts	101
1010	Cash	1010
105	BANK AND CHEQUE	105
1050	Bank	1050
14	SHORT DEBT	14
140	MISC. SHORT DEBTS	140
1400	Misc short debt	1400
147	VAT IN AND OUT	147
1470	VAT	1470
18	COMPUTERS & OFFICE EQUIPM.	18
182	Office equipment, net value	182
1820	Office equipm	1820
1829	Depreciation, Office equipm	1829

If we import this, as a text file to a dimension chart window, we will get:

HAT-Code	Text	Host Code
1	ASSETS	1
10	CASH AND BANK	10
101	Cash accounts	101
1010	Cash	1010
105	BANK AND CHEQUE	105
1050	Bank	1050
14	SHORT DEBT	14
140	MISC. SHORT DEBTS	140
1400	Misc short debt	1400
147	VAT IN AND OUT	147
1470	VAT	1470
18	COMPUTERS & OFFICE EQUIPM.	18
182	Office equipment, net value	182
1820	Office equipm	1820
1829	Depreciation, Office equipm	1829

Note that HAT interprets the codes in the first column as hierarchical codes, regardless of the setting in the drop-down menu Create parents up to level. The HAT-Codes are implicitly assumed to constitute an hierarchy.

Indented

In some cases the hierarchical levels are implemented as different number of space characters, indents, in front of a code. As illustrated below:

A	ASSETS	
·B	CASH AND BANK	
··C	Cash accounts	
···D	Cash	1010
··E	BANK AND CHEQUE	
···F	Bank	1050
·G	SHORT DEBT	
··H	MISC. SHORT DEBTS	
···I	Misc short debt	1400
··J	VAT IN AND OUT	
···K	VAT	1470
·L	COMPUTERS & OFFICE EQUIPM.	
··M	Office equipment, net value	
···N	Office equipm	1820
···O	Depreciation, Office equipm	1829

With the setting Indented the result will be:

HAT-Code	Text	Host Code
A	ASSETS	
AB	CASH AND BANK	
ABC	Cash accounts	
ABCD	Cash	1010
ABE	BANK AND CHEQUE	
ABEF	Bank	1050
AG	SHORT DEBT	
AGH	MISC. SHORT DEBTS	
AGHI	Misc short debt	1400
AGJ	VAT IN AND OUT	
AGJK	VAT	1470
AL	COMPUTERS & OFFICE EQUIPM.	
ALM	Office equipment, net value	
ALMN	Office equipm	1820
ALMO	Depreciation, Office equipm	1829

Level Numbers

This setting is applicable if every file row has a number indicating the hierarchical level of the corresponding component in the dimension chart. The number series starts with 1, 2, 3 etc., with 1 indicating the highest level. The following example illustrates the idea:

A	ASSETS		1
B	CASH AND BANK		2
C	Cash accounts		3
D	Cash	1010	4
E	BANK AND CHEQUE		3
F	Bank	1050	4
G	SHORT DEBT		2
H	MISC. SHORT DEBTS		3
I	Misc short debt	1400	4
J	VAT IN AND OUT		3
K	VAT	1470	4
L	COMPUTERS & OFFICE EQUIPM.		2
M	Office equipment, net value		3
N	Office equipm	1820	4
O	Depreciation, Office equipm	1829	4

When the drop-down menu is set to Level Numbers, another definition page – Level Number – is added in the page panel to the left (below Host Code). In this example column 4 contains the level number, which has to be filled in for HAT to find these numbers.

If you want to check that all field definitions are correct, you can make the definition page File active, and set the display entry (Hex Codes ..etc) to Fields. In this case it looks as follows:

HAT-Code	Text	Host Code	Level Number
A	ASSETS		1
B	CASH AND BANK		2
C	Cash accounts		3
D	Cash	1010	4
E	BANK AND CHEQUE		3
F	Bank	1050	4
G	SHORT DEBT		2
H	MISC. SHORT DEBTS		3
I	Misc short debt	1400	4
J	VAT IN AND OUT		3
K	VAT	1470	4
L	COMPUTERS & OFFICE EQUIPM.		2
M	Office equipment, net value		3
N	Office equipm	1820	4
O	Depreciation, Office equipm	1829	4

When imported, the corresponding dimension chart will be:

HAT-Code	Text	Host Code
.		
▾A	ASSETS	
▾AB	CASH AND BANK	
▾ABC	Cash accounts	
· ABCD	Cash	1010
▾ABE	BANK AND CHEQUE	
· ABEF	Bank	1050
▾AG	SHORT DEBT	
▾AGH	MISC. SHORT DEBTS	
· AGHI	Misc short debt	1400
▾AGJ	VAT IN AND OUT	
· AGJK	VAT	1470
▾AL	COMPUTERS & OFFICE EQUIPM.	
▾ALM	Office equipment, net value	
· ALMN	Office equipm	1820
· ALMO	Depreciation, Office equipm	1829

Parent Links

Occasionally the host system can provide files where each file row has a special code, parent link, that tells HAT the identity of the component it should be immediately subordinate to. HAT can use this information to construct the hierarcy.

Example

A text file has the following codes, where the reference to the closest superior component (the parent) is found in column 4:

1	2	3	4
A	ASSETS		
B	CASH AND BANK		ASSETS
C	Cash accounts		CASH AND BANK
D	Cash	1010	Cash accounts
E	BANK AND CHEQUE		CASH AND BANK
F	Bank	1050	BANK AND CHEQUE
G	SHORT DEBT		ASSETS
H	MISC. SHORT DEBTS		SHORT DEBT
I	Misc short debt	1400	MISC. SHORT DEBTS
J	VAT IN AND OUT		SHORT DEBT
K	VAT	1470	VAT IN AND OUT
L	COMPUTERS & OFFICE EQUIPM.		ASSETS
M	Office equipment, net value		COMPUTERS & OFFICE EQUIPM.
N	Office equipm	1820	Office equipment, net value
O	Depreciation, Office equipm	1829	Office equipment, net value

We would like the component CASH AND BANK to be subordinate to ASSETS, etc. Note that the definition page Parent turns up in the page panel, to the left. In addition to entering that column 4 should be used to define the parent codes to link to, we have to set the field containing the parent identity. In this case the alternative Text is chosen (from the set HAT-Code, Text, and Host Code).

The resulting dimension chart will be identical to the one created on the former case (see “When imported, the corresponding dimension chart will be:” on page 66).

HAT-Code

Basically you enter the field number and/or the character positions of the HAT-Code here. The contents of the definition page varies somewhat, depending on the setting of Hierarchy on the Format definition page.

Text

Enter field number and/or character positions of the dimension component texts, here.

Host Code

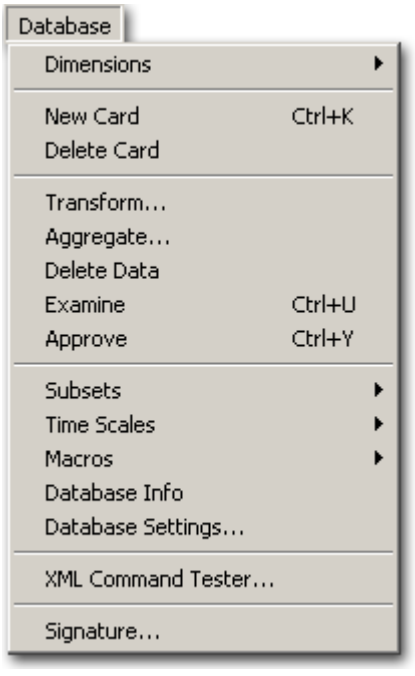
Enter field number and/or character positions of the Host Codes, here.

Zero Filling works in the same way as with the import format for transaction data. See “Zero Filling” on page 41.

6

The Database Menu

Other Commands

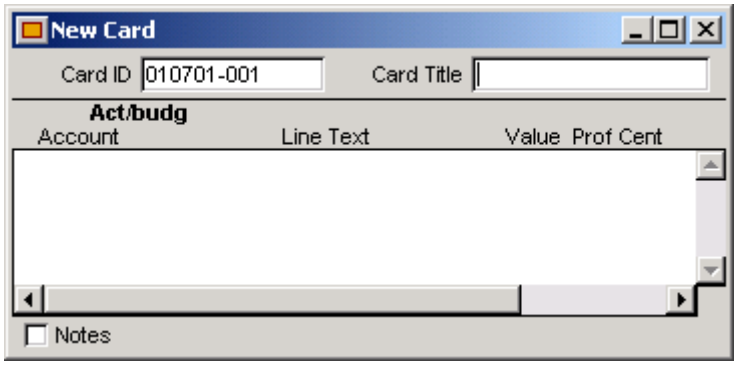


Introduction

This chapter describes how you can make changes to a HAT database. We add Cards, delete them, aggregate or transform them. Note that we always, conceptually, make a clear distinction between the *HAT database* (which reside in the internal memory, the RAM), and the corresponding *HAT-file* (which is stored on a secondary medium, usually a hard disk). All the changes described here only affect the HAT database. Not until the HAT database is saved, the changes updates the more permanent HAT-file.

New Card

The New Card command opens a window for creating a new Card. Use it when you want to add data to your HAT database.



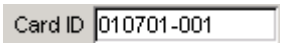
See page 7, for a picture of the ”anatomy” of a Card.
The rules for editing in a new Card also apply to existing Cards.

You can edit a new Card by using the techniques listed below. The Created and Modified fields are filled in automatically when you close the Card window.

Editing a Card

Header and footer edit boxes

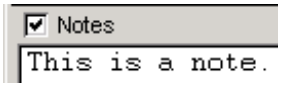
Card ID



The default Card ID of a new Card, is today's date plus an ordinal number.

If you change the date, a correct ordinal number will be provided automatically. The new Card ID will be shown in the title bar of the Card window the next time you open it.

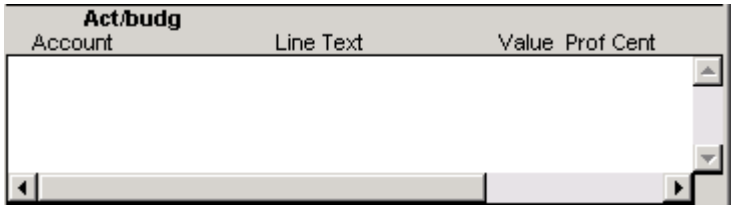
Card Title and Notes



Contains any text, up to 1023 characters long. You edit it in the same way as any other text string.

Fields in the Card body

The borders of the data fields in the Card body are not explicitly displayed on the screen, but the fields have their defined positions (according to the column headers) and it is possible to edit them:.



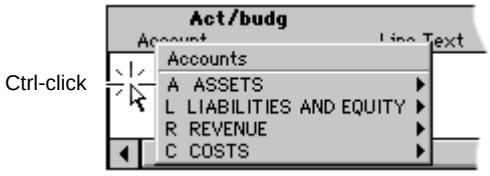
You can move the insertion point between the data fields in a Card with the Tab key. Use Shift-Tab to go backwards.

Create a new Line by pressing the Enter or Return keys.

If you want to enter a component from Dimension 1 (e.g. A Actuals for Demo Inc), you can indent the Line with Shift-Tab, or by clicking with the mouse in the appropriate position.

Dimension components. To enter a dimension component, you can use the keyboard to enter its HAT-Code, Text, or Host Code.

You can also get access to the whole dimension chart, by using Ctrl-click in the dimension field:



Release the Ctrl-key before you release the mouse button, to actually enter the highlighted component.

Choose between mouse control and keyboard control exactly as in dimension boxes in analyses. See section “Selection Boxes – Dimensions” on page 103.

It is easy to change the order of the Lines in a Card. Simply drag the selected Line to the desired position by a point-and-hold down-click in the left margin of the Line.

You can also move Lines and Groups with Ctrl-Up Arrow or Ctrl-Down Arrow.

Value field entries

Several arithmetic functions can be used in a value field of a Card, to simplify the entry of values:

Function	Symbols	Example		Spelled out
		Entered in field	Result when you leave the field	
Copy from previous	prev or "	10 000 "	10 000 10 000	Enter same value as above
Total	sum	10 000 15 000 sum	10 000 15 000 25 000	Sum of all preceding fields in the same Group
Balance	bal or =	- 10 000 25 000 =	- 10 000 25 000 15 000	Balanced sum, i.e. sum of all Lines in the Group with reversed sign
Calculate	+, -, etc	120*0,2	24	Result of the expression

An arithmetic expression can also include any of the special operators.

MacOS
Instead of sum, the symbol ∑ can be used.

Delete Card

The command Delete Card only works if a Card window is currently active.

When you select the command, the entire Card is deleted from the HAT database. The deletion is not made permanent in a HAT-file until you Save the database.

Note that you can also delete a whole set of Cards, by using the command Delete Data, further down in this same menu (see “Delete Data” on page 82).

Transform…

Introduction

The Transform command lets you to change a part of, or all, data in a HAT database.

A similar command is Add which adds new, transformed, data to the original database.

These commands are useful in e.g.

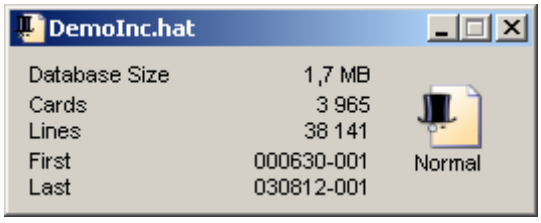
- Prognoses based on actual outcomes
- Budgeting
- Simulation
- Project planning and follow-up
- Index adjustments
- Exchange rate adjustments
- Consolidation
- etc.

Data affected by transform

To transform a set of data, you first make a selection in one of the templates. We call this the *active selection*. Then, when you press the Transform button, all the data in the active selection will be affected.

I.e. the Transform command transforms the following data:

- All the Lines defined by the selection in a Lines template.
- All Lines similarly defined in a Cards template. Note that only some parts of the Card data may be affected, depending on the selections made in the Groups and Lines drop-down menus, in the settings page Options, in the Cards template.
  The borderline case when these are set to None, is treated as if all the Lines in the Cards are selected – i.e. when only the Card Titles are displayed in the Cards template, all the underlying Lines will be transformed, in spite of not being visible.
- If the database window is active, it represents the whole database, i.e. all the Cards and all the Lines.

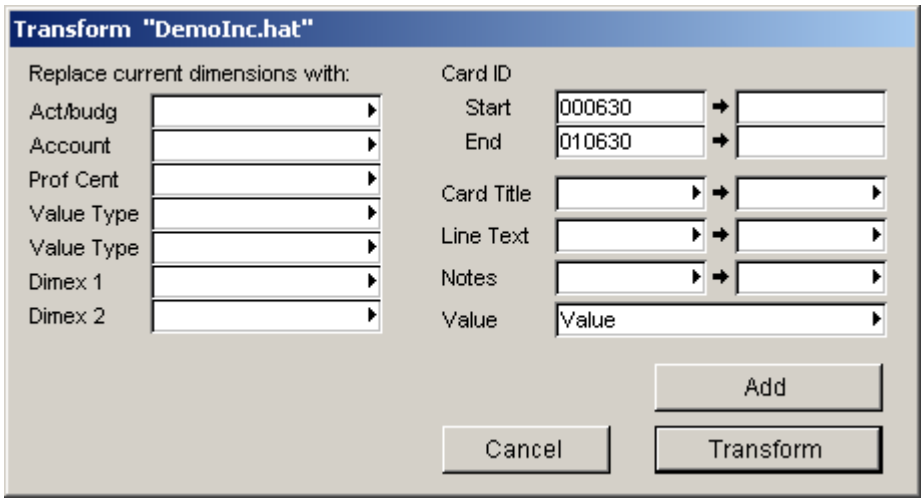


  A transformation will thus affect all the data. Use with care!
- An individual Card in active, editable, mode.

Add generates new data. With the command Transform, the existing data are changed. In all cases but one, you have an alternative option – Add. It generates new data from the current ones, and adds them to the HAT database. The exception is the single editable Card, which only can be transformed. To add a new Card, based on an old one, make the Card active. Enter the desired changes by normal editing operations, and close the Card window. You will then get a dialogue window, with the option to Add it as a new Card to the database.

Transform operations

The transform window has a number of entries allowing you to change all or part of the fields in the active selection:



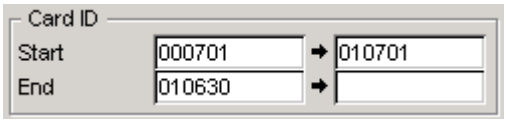
Replace current dimensions with. Actually this is a short form of the sentence ”Replace current *dimension component* with”. If you specify a component in a dimension box,

the new component will be assigned to all Lines in the active selection.

Example

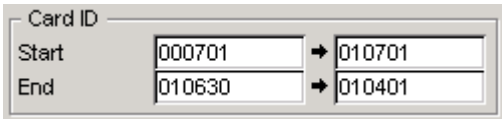
You may want to simulate the result for next year on the basis of the current year's actual figures. You keep all actual values exactly as they are, but tag the transformed numbers as budget figures for the next year. In this case you Add the new data to the database, instead of just changing the old ones (with Transform).

Card ID. Replace the current Start Card ID with a new starting point:

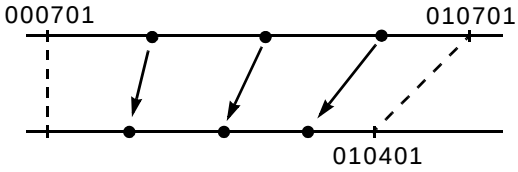


000701 will be replaced by 010701 in the new Lines set. All other Lines in the active selection will also be offset exactly one year forward. This is so, because the right End box was *left empty*. In this case the new End value is implicitly

assumed to be moved exactly parallel in time, with the Start value. Had we instead entered a value, say 970401, in the last End box



all the Lines in the left Start-End interval would be proportionally spread over the new (in this case smaller) time interval:



Card Title, Line Text, Notes. Transformation of text in these fields works in a similar way. Basically the function is the same as Search and Replace in a word processor.

Example

With the following entries

all empty Line Text fields will get the text 'check!' in them.

Every occurrence of the text string you enter in the left box will be replaced with the text you enter in the right box. The search text is not case sensitive, but the replace text will be entered exactly as it is entered in the replace box. The following operators are available in the search box:

Operator	Meaning
< Before	The new text will be appended before the current text
> After	The new text will be appended after the current text
\ Empty	All empty text strings will be replaced by the new text
¬\ Non-empty	Any text string will be replaced by the new text

Value. You can enter a formula in the value box to define new values in the Lines. The current values are represented by the text string "Value" in the formula (default entry in the box). The formula can contain any arithmetic function allowed in HAT. By clicking (left click or right click) on the pop-up arrow in the box, you can enter the two standard values Value and Time[1].

Enter arithmetic operators either from the keyboard or by clicking on the pop-up arrow in the Value box.

Example

You want all values in the selection to be reduced by 13.5%.

1. T represents a variable that increases from 0 to 1 in one year (see section "Operators in formulas" on page 159).

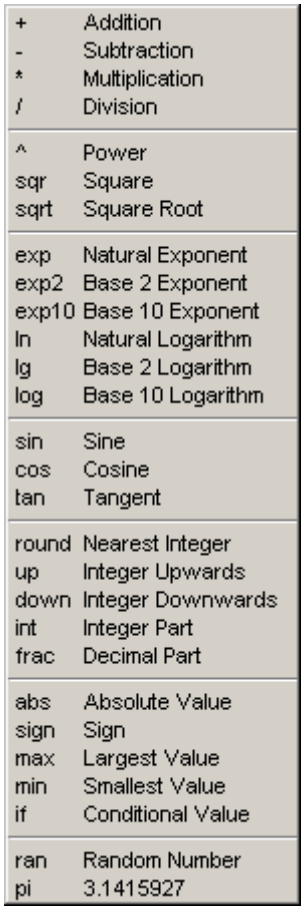
This can be used e.g. to simulate a cost reduction in a forecast.

Many value fields. As in many parts of HAT the case of many value fields does not implicate anything fundamentally new, compared to the case with a single value field. But Transform gives an opportunity, worth of special attention. You can create new value fields from the existing ones. Let us assume that the lines contain sales data, with number of units, list price, and actual sales value. You can then create a new field calculating the discount as:

No * List price - Sales value

and put this value into an empty value field, called Discount.

Value operators. The full set of operators that are available in formulas in e.g. Time Functions are also available for use for transformations:



You can access them by right-clicking on the pop-up arrow in the Value box.

For explanations of the less obvious ones, see “Available operators” on page 159.

Signature. When you select the Transform or Add command, HAT requests a signature which will be used for the new Cards. Any signatures in the Examined and Approved fields are removed, and the Modified field is filled with the date and the signature for this transformation.

Splitting Cards during transformation

If the information on the Card level (Card ID, Card Title, or Notes) is unchanged by a transformation, all Lines are retained within the same Card.

But if a transformation affects only some of the Lines on the Card, the transformation generates two Cards. One contains the transformed Lines with new Card information, while the other retains the “original” Card information and the Lines that were not transformed. The date in the Created field is set to the date of the transformation.

Some potential side effects of a transformation.

If you transform accounting vouchers, some Lines may be transformed, but not all. This can result in vouchers that no longer balance.

Transformations that lead to a displacement in time can also result in Lines being spread over several Cards, although they originally were on the same Card.

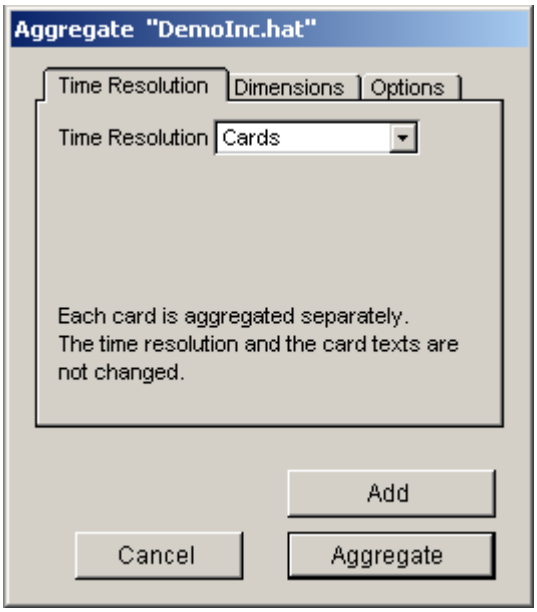
Aggregate ...

Introduction

With HAT you can handle large volumes of detailed data with ease. But occasionally the volumes simply are too detailed to be meaningful, or the volumes of data are too large to fit into the internal memory. By summing individual values to aggregate values, you can often achieve stunning reductions of data volumes. At times you want to keep the details for the most recent data, e.g. for the last year, but are fully satisfied with monthly aggregates for earlier years. With the Aggregate command you can choose to aggregate a part of the database.

The Aggregate command operates on the active data displayed in a Cards or Lines template, or in the database window, just as the Transform operation.

E.g. if a Lines template (with a certain selection) is active when the Aggregate command is invoked, the following dialogue window turns up:



The first two tabs allows you to specify aggregation criteria with a combination of time intervals and dimension components. The tab Options, in addition, provides the opportunity to aggregate values with identical Line Texts.

Aggregation groups

With these settings we can combine transaction values into broader categories. This is done

- in the time dimension, by grouping separate Card IDs into longer time intervals, e. g. monthly groups
- in other dimensions by using their corresponding dimension charts to specify how low level components will be grouped into higher level components, e. g. individual accounts are combined into account classes, and profit centers into business areas.

If we combine these settings they will form a number of “sorting classes” which we call *aggregation groups*. e. g. assume that we have transactions for a full year, which we would like to aggregate into two half year categories, and that we

would like to combine the accounts into four main groups, and the profit centers into three main groups.

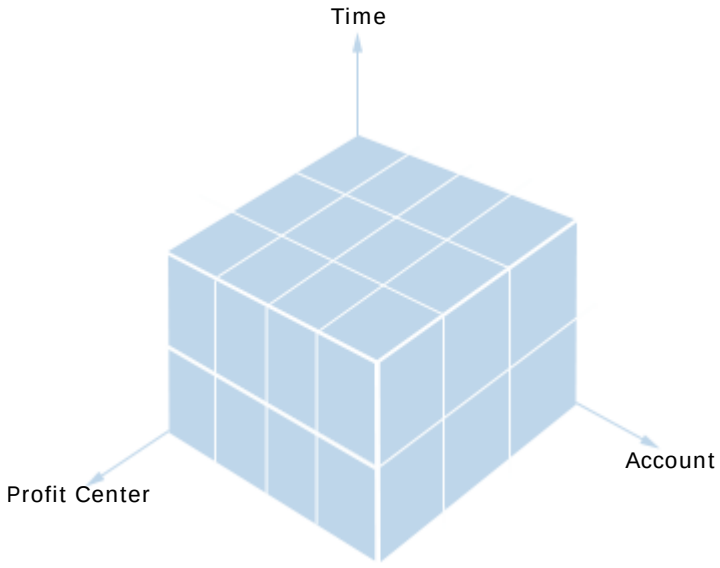


FIGURE 4. Aggregation groups

The number of aggregation groups will be

2 x 4 x 3 = 24

Every one of the original transactions will be placed in one of these aggregation groups. The actual aggregation means that all transaction values in the group are summarized into one single transaction. Thus, the aggregated database will in this case consist of no more than 24 aggregated Lines – regardless of the number of Lines in the original database, which could be millions.

Aggregation – an example

In the next section we will describe the different settings in detail. Here we will, using our example database Demo Inc, briefly illustrate how you set up an aggregation, and what happens with the data.

DemoInc has one dimension called Prof Cent's, with the following structure:

West
- M/S HEIDI
- M/S KATJA
- M/S GUNILLA

East
- M/S ANNSOFI
- M/S BARBRO
- M/S MARIANNE
- M/S ALEXANDRA
- M/S CAROLA

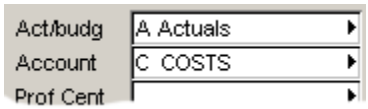
We want to add up all the cost transaction values

- by month
- and the groups West and East,

for the period 2000-06-30 until 2001-06-30, i. e. the full year containing data.

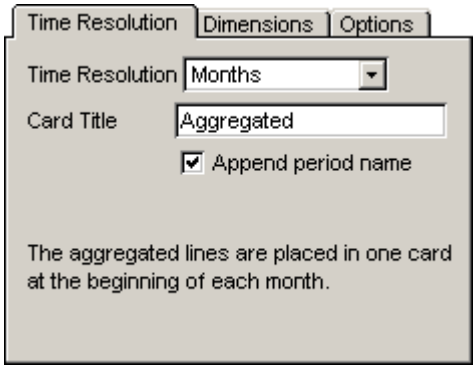
We will achieve this by

1. Specifying which transactions to aggregate, e. g. by selecting the relevant transactions in a Lines template:



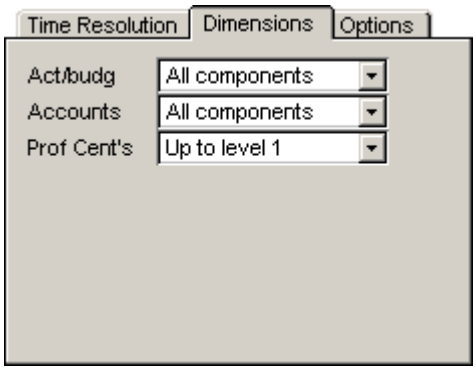
We have chosen to aggregate the actual cost items, for all profit centers.

2. On the first tab – Time resolution – we enter Months:



We keep the default value for Card Title, i. e. the cards created will get the card titles Aggregated 0007, Aggregated 0008, etc.

3. On the second tab – Dimensions – we choose to aggregate Prof Cent's to Level 1, the highest level in the dimension hierarchy:



For the other two dimensions all the components in the dimension charts will be used to form the aggregation groups. This means that the aggregation in these dimensions will be minimal.

4. Finally, press the button Aggregate to perform the actual aggregation operation.

The result is calculated as follows:

- Only the displayed Lines will be affected, i.e. only Lines with Actuals in the first dimension, and COSTS in the other.
- Every one of these Lines are picked out from its current card. The remaining parts of the card will, of course, be left where they are (unless there are no lines at all left in the card, then the card will be completely removed from the database).
- If such a Line has a profit center code, it will be changed to the corresponding first level component code – M/S Carola will be changed to East, etc.

- The Line will keep its Account coding, because All components should be used to define the aggregation groups, in this respect.
- Every line that is picked out, will get one (and the same) Card-ID, representing the beginning of the month it formerly belonged to.
- Each aggregation group will then contain Lines with the same date, account, and profit center (at the highest level). All Line values in the group will be added to form one value, and entered into a single line, representing the aggregation group as a whole.
- The aggregated Lines with the same date, will be entered into a new Card, with the Card Title Aggregated 0007, etc.

Note that

- Cards which were once balanced (i. e. the sum of all individual values in the card added to zero, which is usually the case in accounting data) may be unbalanced, if one or many lines are removed from the card.
- Certain cards may disappear altogether, if each line in the card belongs to some aggregate.
- The original Card Title, Line Text and Notes will not be retained in the new, aggregated, cards (but in some circumstances you may choose to keep the line texts, in the Options tab, see below).

- The consequences with unbalanced cards, removed cards, etc only applies to the case when the Aggregate button is pressed.
  If the button Add is chosen, the aggregated cards are added to the database, and the original cards remains exactly as they are.

Aggregation – detailed settings

The first tab - Time Resolution

There is a large number of resolutions to choose from:

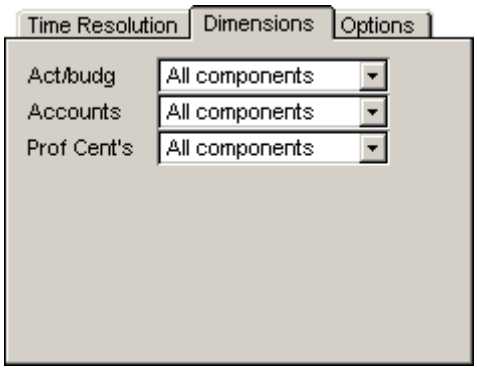
If you have defined any time scales of your own, in Time Scales, they will be appended at the bottom of the list (Calendar months and Fiscal months, in this case).

The meanings of the alternatives are generally straightforward. A few comments should suffice:

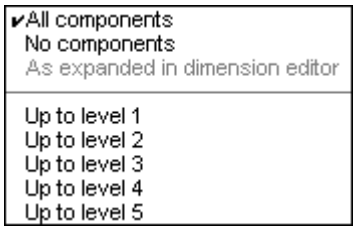
Single Card	All data in the selection are aggregated to one card, which may consist of a large number of lines, depending on how many aggregation groups there are.
Years ... etc	The transactions are aggregated to period values, following one of a number of standard calendar resolutions.
Fiscal months	The aggregation follows the time resolution as defined in Time Scales (see section “Time Scales” on page 87, later in this chapter).

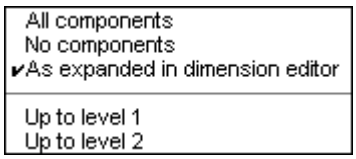
The second tab – Dimensions

By default the settings are to keep the dimension components as is, i. e. the resolution is using All components from the dimension chart:



There may be many possible alternatives. HAT investigates exactly which ones that are viable, and displays them. As in these two cases:



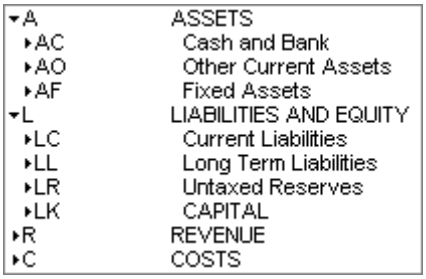


All components. All dimension component entries are kept as is. No aggregation will occur, in relation to this dimension.

No components. No dimension components at all will be used for this dimension. In relation to this dimension, the maximum aggregation will occur.

As expanded in dimension editor. You can tailor the aggregation, for a certain dimension, to your own requirements by expanding its dimension chart.

In the following example the dimension chart Accounts is expanded one level for Assets/Liabilities and equity, and not at all for Revenues and Costs:

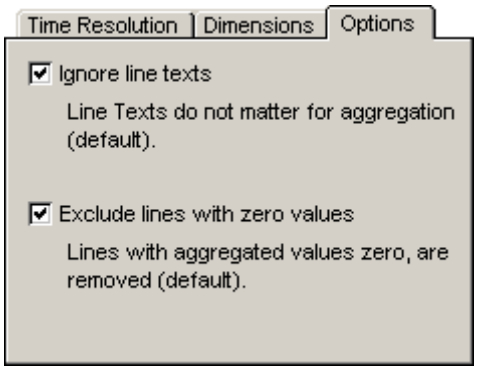


In this way it is possible to define a very specific aggregation scheme.

Level 1, Level 2 etc. Aggregation is done to the highest level, second highest level, etc depending on how many levels are available.

The third tab – Options

Contains two more special alternatives:



Ignore line texts. When the alternative is ticked, HAT will ignore the line texts, when aggregating. This is the standard choice. Although not very often, it may happen that you want Line Text to act as an aggregation criterion. If there is relevant information in the line texts, e. g. names of suppliers, customer numbers, and you want to add all values referring to each supplier or customer, you can achieve this by unticking this alternative.

Exclude lines with zero values. When all line values are aggregated, some of the aggregated values may be zero. You often have no use for them. Only when this alternative is unticked, the zero value lines will remain in the database.

Delete Data

The Delete Data command deletes data from the database. The data to be deleted are determined in the same way as for the Transform command, i.e. “what you see is what you delete”.

Note the not-so-obvious feature, that the database window represents all the data in the database, so if this window is active you will delete all data in the database with this command.

Examine, Approve

The data in the Examined and Approved fields are often imported into the database together with the rest of the data on the Card.

By using the commands Examine and Approve in the menu, you can enter data in these fields from HAT. This can be useful in various situations, such as auditing.

Both commands work in the same way. When you select the command, the date, time, and current signature are registered in the Examined or Approved field on the currently open Card.

Signature. If you have not defined a signature using the Signature command, HAT will ask you to do so the first time you use Examine or Approve.

HAT requires a signature, and automatically enters it in the appropriate Card(s), when you select any of the following commands:

New Card
Examine
Approve
Transform...

This is also the case when you close a Card which you have changed.

You define a signature by entering 1-3 characters (letters and/or digits) in the dialogue box. You can use upper case and lower case letters to distinguish signatures, i.e. BEM is not the same signature as Bem.

The entered signature is in effect as long as the database remains open. It is not saved with the HAT file (except in the signed Cards).

Do not confuse the signature with the password, which is required for access to a protected database.

Subsets

Usually you will use the entry fields on a Selection definition page of a template, to define a selection for that template.

But occasionally you want to achieve what you aim for in a somewhat simpler and more straightforward way. E.g. if you use a certain selection over and over again, you would probably prefer to be able to define it once and for all.

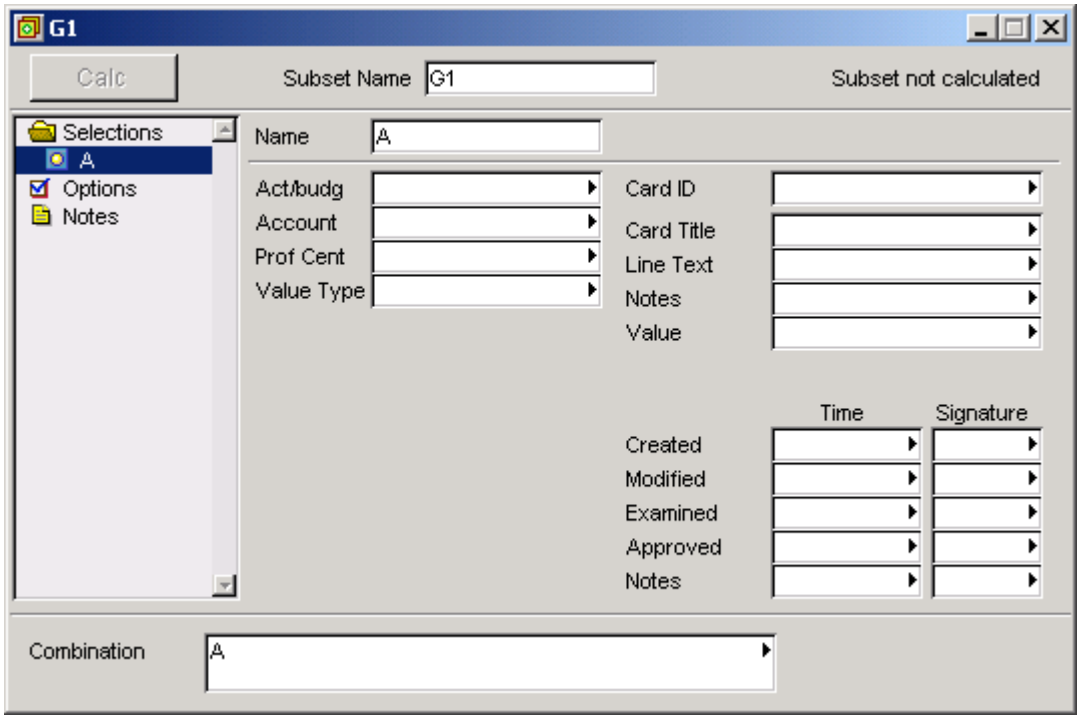
You can also do more advanced selections than allowed on a Selection definition page. E.g. define a number of different selections and use them to define one combined subset.

For these purposes you have two types of subsets available:

- *Global Subsets*, i.e. subsets that are ”globally” available, to be used in various templates, and other contexts.
- *Local Subsets*, which are defined for a certain template, only.

The two types are essentially equivalent, the main difference being that a Local Subset is defined for a single template, whereas a Global Subset is available for use in any template. Another difference is that you can refer to a Global Subset from a Local Subset, but you cannot refer to any other subset (neither Local och Global) from a Global Subset.

In this section we will only cover the generally available Global Subsets. Note that the word Global is never used in the HAT program, we only use it in this manual to make it easier to keep the two different types apart. With the command New Subset you will get an empty selection to fill in:



Ordinary selections vs Subsets

Compared to what is available in the selection entries of an analysis template, you can:

Combine many selections. You can define more than one independent selections. By clicking on the Selections folder in the left panel you will be able to enter another selection (click the button New Selection) which will get the default name B. By repeating this operation a number of times, you get the selections A, B, C, D, ... Their individual names can be changed to more descriptive ones, if desired. Do this by entering a new name in the Name field. You

can also enter new selections by right-clicking on either the Selections line (with the folder symbol) or on an individual selection (e.g. A), and choosing New Selection from the pop-up menu.

You can then combine these independent selections to make more complex ones, by writing a logical expression using the individual selections already defined, e.g

A & B | C

which means the set of Lines in both selections A and B, combined with the Lines in selection C.

Use more fields in the selection criteria. Each definition page has more fields available for defining selections, e.g. the fields Time and Signature.

The operators cards and groups

In the box Combination you can enter any logical expression, as mentioned above. Two operators are specific for subsets:

- cards
- groups

If you have made a selection A by entering a number of criteria, this in effect selects the *Lines* that meet these criteria. But you may want to select all Lines in a *Card*, which contains at least one Line that meets the criteria. By entering

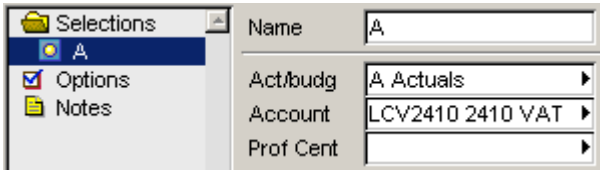
cards A

in the Combination box, you will get exactly this.

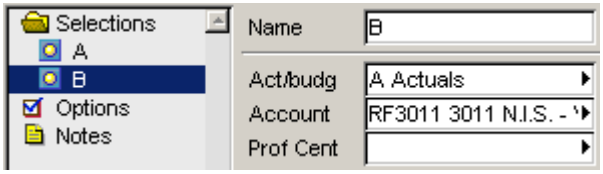
The groups operator is analogous, with the obvious difference that you instead get all Lines of the selected Group.

Example

In the Demo Inc database there are Cards with different kinds of VAT entries, in the Account dimension. These entries typically go in pairs – if a certain type of revenues is posted on one line, it should also be a VAT entry in another line in the same Card. To check this, we define a subset with two variables, A and B:

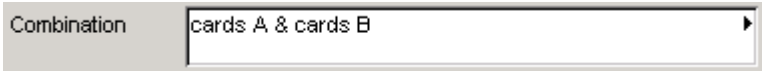


and

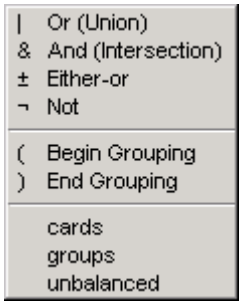


HAT enters the default combined expression A|B, which you easily can change.

We change the expression to



and press the Calc button, to get the selection calculated. Often it is simpler to enter selection names (A or B) and the operators (cards or &) using the pop-up arrow to the right in the Combination box. You activate the selection names pop-up menu by left-clicking on the arrow, and the operators will be available if you right-click on the same arrow (AltGr+left-click will give the same result).

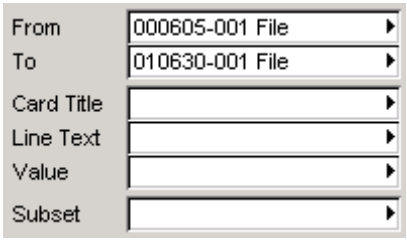


We change the (default) name of the subset, from G2 to

VAT vouchers

which will turn up in the menu after we have closed the window

As soon as the first subset has been installed in the HAT database, every analysis template will get another entry box, Subset, added after the Value box:



In this box you can enter the name of the subset by typing its name from the keyboard, or by using the pop-up arrow

Note that it is not possible to make the same selection, without using a subset, e.g. in a Cards analysis template. It is possible to select all Cards that has at least one of the account entries ’2410 VAT’ or ’3011 N.I.S. - VAT 100%’, by entering the expression LCV2410 | RF3011 in the Account dimension box. But if you would try with the expression

LCV2410 & RF3011

no Cards (or Lines) would be selected at all. The reason is that you always specify *Line* attributes in the analysis templates selection boxes, and a Line cannot have two different codes from the same dimension, of course.

The unbalanced operator

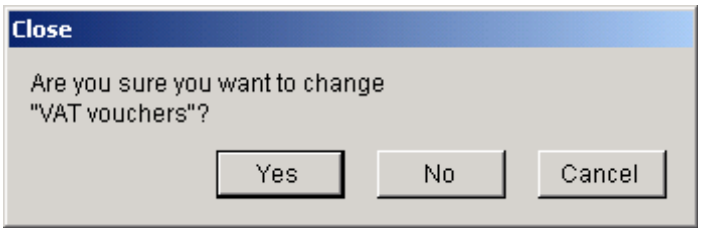
Occasionally you want to find Cards which are “unbalanced”. A Card is “balanced” if the values in it add up to zero. Vouchers in an accounting database are the primary examples of such Cards. The operator unbalanced is not defined for Cards as such, but for the sub category Group, to cover also those rare cases where many “sub vouchers” are included in the same Card, one in each group. You can use this operator without an argument, or specify that it should be applied on a certain subset:

unbalanced	all Groups (often equivalent to Cards) containing line values that do not add up to zero
unbalanced A	all Groups in the selection A, with line values that do not add up to zero.

Add and delete subsets

You can enter and delete subsets with the commands in the submenus:

You install a new template, or change an already installed template, by closing its window. Make your choice in the dialogue window:

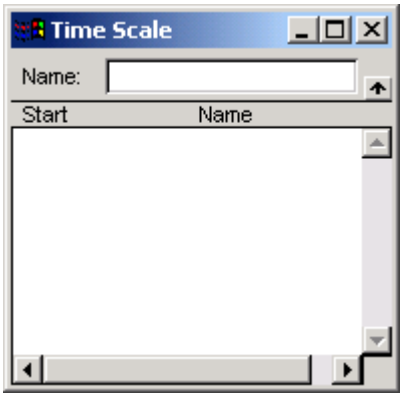


Time Scales

HAT has a number of built-in time scales, which are used in the Time Functions templates. But you also have the option to create you own customized time scales. This is very useful when the usual calendar time scale does not fill your needs. E.g. if you are working with financial periods specific for your company.

Similarly, semesters sometimes is more relevant for schools and universities, than the usual calendar time.

New Time Scale. Will produce an empty window



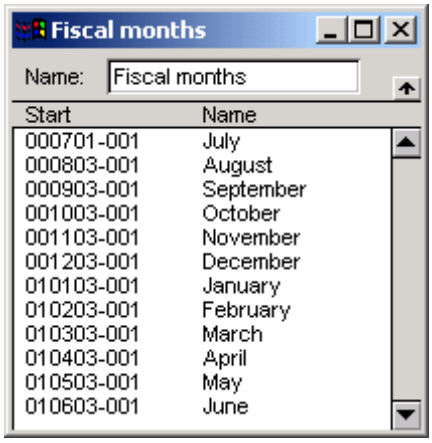
- Enter the name of the time scale.
- Enter the *start* of each period in the scale.

  YY (03 will return 030101-001)

  YYMM (0302 will return 030201-001)

  YYMMDD (030205 will return 030205-001)
- Enter the name of the period.

  The end of a period is defined automatically as the last Card-ID before the start of the next period.
- Enter the start of next period,
- and so on.…



If you want the period to end before the last Card-ID, you can define a dummy buffer period to force a period to end in the right place.

The time scale is entered into the HAT database, when you close the window.

Importation to a Time Scales window. Instead of entering the time scale elements via the keyboard, you can import a *text file* with two columns (i.e. the fields are separated by Tab) to an active Time Scales window. This can be done in either of two ways:

- Using the Import command in the File menu. A Time Scales window has to be open and active. The Import command then changes to Import Time Scales..., and you get the usual dialogue window for opening the text file.
- Drag-and-drop. Drag the text file icon on the Time Scales window and drop it there.

Macros

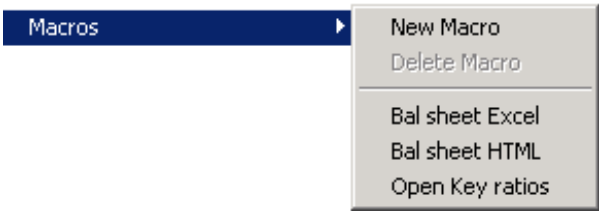
With HAT Macros you can instruct HAT to do a series of operations automatically. At its current stage the set of instructions is designed with an emphasis on simplifying the operations to produce HAT-applications from ground up, often in large numbers. The typical tasks of someone who has an Operator- or Server-processor attached to the computer. If you do a long sequence of operations over and over again, e.g. produce 50 different HAT-files for different users, you may benefit a lot from writing HAT Macros to perform these operations automatically. Together with the OLE support built into HAT, you can build astonishingly simple, fast, and fully automated solutions, that produces large number of HAT-files and distributes them to the users.
Also, if you are preparing an HAT application for use by someone who is a novice at HAT, you can install HAT Macros that do the complicated operations. Thus requiring a minimum of knowledge on how to operate HAT.

You can also perform the equivalent of a series of macro instructions by importing a special segment of a HAT-Text file. This segment is called *Commands section*. See HAT 5 Text File Format for a technical description of the HAT-Text file format in general, and the Commands section in particular.

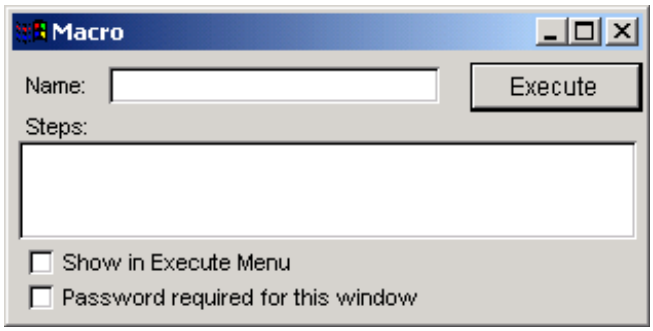
Because it is primarily intended to be used by skilled “technical people” this material is of limited value for the most HAT users. If you just use HAT for regular analyses, you can safely skip these parts of the manual. Almost everything you can do with macros, you can also do by interacting with your HAT application in the usual way. And in a much easier too – this is the very purpose of the HAT user interface.

The following description gives you a brief overview of Macros and the Commands section. To get the details on Macros, see the HAT 5 Macro Langauage Reference.

Creating macros



With the command New Macro, you get an empty window:

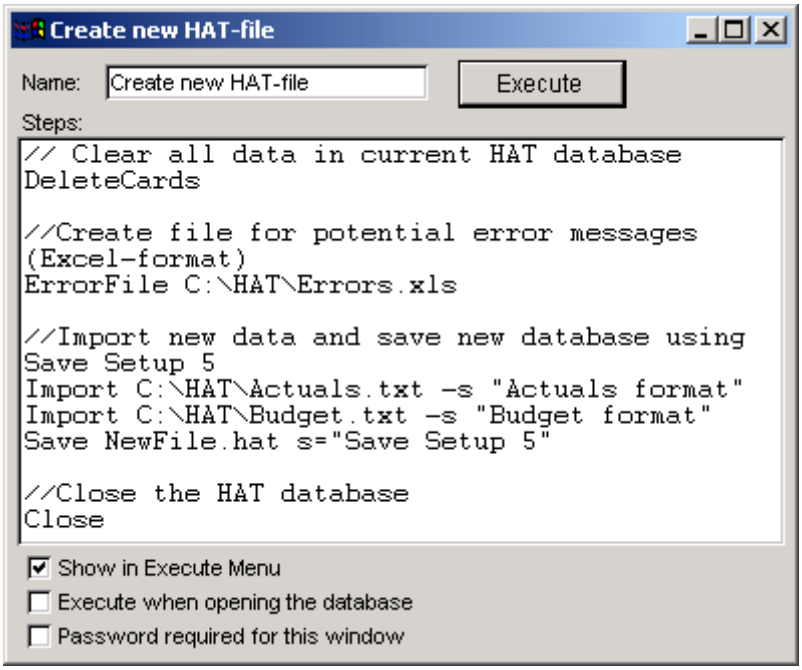


Name. If you want to install a macro in the HAT database, you have to give it a name.

Steps. A HAT Macro script consists of a number of steps, one step on each line. A step corresponds to one general command, usually with information on what object this command should operate on, and often with some further specifications on what to do.

Example

A typical case is when we want to update an existing HAT Database with new data. With a suitable macro, all the production steps will be performed quickly and with a minimum risk of mistakes:

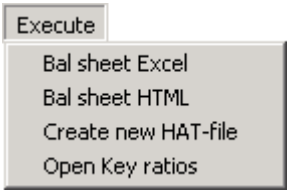


A few comments to the script:

- Double slashes (//) are used to indicate that the text that follows (on the same line) is a comment, which plays no active part in the execution of the macro. It is "dead text" with the only purpose to clarify what the macro does. It is a good practice to use a lot of comments in macros.
- DeleteCards is a macro command, which deletes all Cards in the current database. This command also has the option to delete only a part of the database.
- the ErrorFile-command is further specified by specifying that a text-file with the name Errors.xls will be created. It is wise to always include this command when macros are used to import files. Potential error-messages will be stored without interrupting the importation process; otherwise error messages will show up on the screen, requiring user interaction to be able to continue.
- Two files are imported, each one using its own import format, which is indicated with the last words e.g. *-s "Actuals format"*. The -s part tells HAT to use a Save Setup, and the "Actuals format" tells HAT which format to use. We have to place double quotes around the text *Actuals format* because it has a space character in it. The space character is used as a word and command separator in a HAT Macro script, but with the quotes, the text *Actual format* will be interpreted as one single entity.
- After the HAT-file has been saved, using the setup *Save Setup 5*, the HAT Database will be closed.

Show in Execute Menu. If a macro is the first one for which you choose this option, a new menu element, Execute, will be created (positioned between the

Analysis and Window menu elements), with this macro in it. If the menu already exists, it will simply be added to the list.



The list is displayed in alphabetical order.

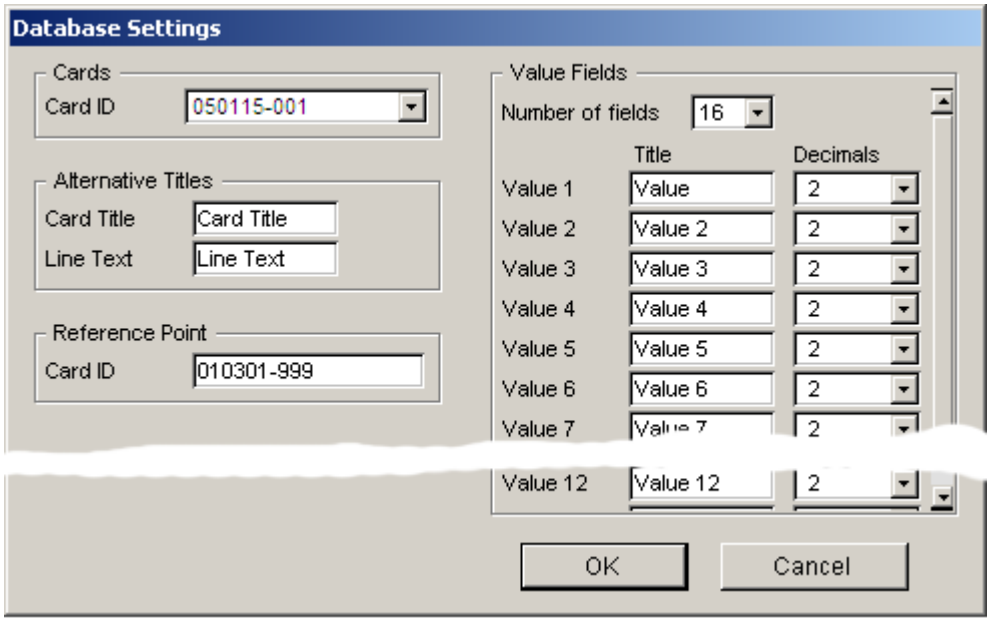
Password required for this window. A macro may contain information you want to keep from general display. Especially if the macro itself contains passwords to other files. By choosing this option, you cannot open the macro script without providing the same password you need to open the file itself.

Database Info

To get a more detailed picture of different aspects of the database and its contents, use the command Database Info. You get exactly the same information if you click on the HAT file symbol in the database window. For a full explanation of the contents see “Information in the database window” on page 16.

Database Settings...

Settings can be customized for each database and is saved with the HAT-file.



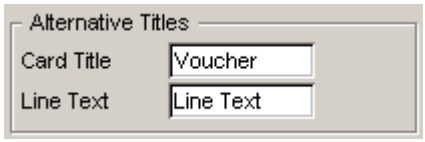
Cards

Card ID. Defines the number of digits in the Card ordinal number that follows the date number.

This setting is automatically adjusted by HAT to comply with the contents of the database, but in some cases you may want to show more digits than necessary.

Alternative Titles

You can change some of the field names used in the HAT templates.



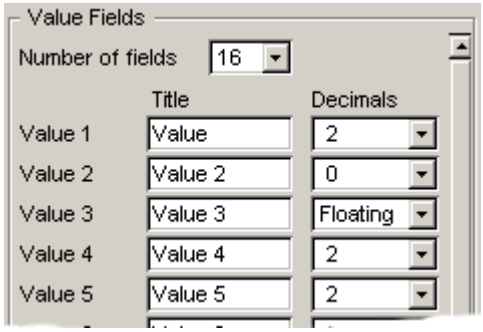
In this case the default text Card Title is changed to Voucher.

Reference point

Gives the position for a vertical Line (which is red, on a colour display – otherwise black) in templates that show data by time, in graphic mode. The Line can e.g. mark a date of special interest.

It also acts as a common reference point in time. You can refer to it e.g. in templates you have installed – to be used as a ”global” variable. It is named Reference. By changing the value of the reference Card ID, the contents of all these templates will change accordingly.

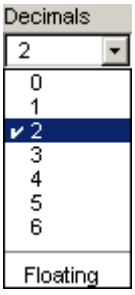
Value Fields



Number of fields. Determines the number of value fields that will be available in the database. The default value is one, and the maximum number is 24. You can change this setting at any time, upwards or downwards. But be careful when you reduce the number of fields – the fields are deleted from the bottom and up. If they contain data, these data will be lost.

Note that there can be perfectly sensible to specify a larger number of value fields, than there is in the imported data. If you want to create new fields calculated from the imported ones, start by increasing the setting here.

Title. If useful, you can change the field names here, to make them more descriptive.



Decimals. Defines what number of decimals (in the interval 0 – 6) to use for each value field;you can also specify it to be “floating”. This setting affects two things:

1. What will be displayed in the cards
2. If the values will be saved as “ordinary” decimal numbers (and number of decimals), or if they will be saved in the Floating format.

The appropriate number of decimals is detemined by what type of values the value field represents. Number of units will usually be integers (e g no decimals), and dollar values should have two decimals (cents).

Numbers are called *Floating* if they are expressed with a single digit number, a decimal point followed by a number of decimals, and an exponent value. They look like these examples:

Floating	Corresponding decimal number
5.6789E+2	567.89
1.0246E-2	0.010246

All modern computers do a lot of their processing with floating numbers, and that goes for HAT as well. This way of expressing numbers is mostly used in scientific and engineering contexts, not in administrative applications.

What number of Decimals should I use?

It is usually best to set the number of decimals to the number that is natural, for the type of values stored in the corresponding value field. Setting a small number of decimals will not lead to large rounding errors in the calculations. On the contrary, HAT uses the information on the number of decimals to improve the precision of the end result. A setting in the interval 2-4 decimals is often appropriate.

Usually there are good reasons to *avoid* using the setting Floating. It should be used only when necessary, e. g. when the set of data includes extremely small numbers. If you set a certain number of decimals, you can not set it higher than six; with this setting the value 0.0000009, will be saved with no decimals at all, i. e. be zero. In some cases this may be fully acceptable, even an advantage. But in another case these small numbers are highly relevant, and it would be a major flaw to “round it off” to zero.

Regardless of this setting, HAT always works internally with the maximum precision available in the computer. Not until data are saved to a file, the number of decimals will finally be restricted to the set Decimals value.

On numbers in HAT – read if especially interested

The major advantage with floating numbers is that it gives maximum precision regardless of the absolute size of the number.. Besides being an advantage when representing very small numbers, this is important when the numbers are parts in a series of calculations, each producing small rounding errors, e g when you do a number of transformations in HAT.

Personal computers usually have a precision corresponding to 15-16 decimal places. Paradoxically, this is often not enough in an accounting application. You are not satisfied until all debit and credit line items “balance”, i. e. their sum should add to zero – *exactly.* A deviance of a billionth of a cent is not good enough!

There are basically two sources of small “errors”:

1. Internally computers work with binary numbers. Unfortunately you can not translate every decimal number to an exact binary replica (using a finite number of digits). This is a sad mathematical fact, which is impossible to overcome.
   So, strictly speaking, the numbers that the computer works with will to a large extent be approximations, although very good ones.
2. The internal floating number calculations produce very small rounding errors. The computer can only hold a finite number of “binary decimals” in memory. This is analogous to the problem of representing 1/3 with a finite number of decimals. We would like to store it as 0.3333333 ... in an indefinite sequence, which of course is practically impossible. Regardless of where we stop, after the first ten, or the first thousand decimals, a small rounding error will inevitably occur.

For these reasons the computer can produce a sum of line item values in an accounting voucher, which is very close to zero; the difference may be a billionth of a cent. Obviously of no practical importance, but the computer may still produce an alert – “the transactions do not balance”. If HAT “knows” that this type of number should be expressed with two decimal places, it shows an appropriate rounded value. It may display the value 0 (zero), although the exact sum is 1.2e-12, had it been displayed as a decimal floating number.

The floating number format is used in HAT to get the best possible precision and speed in all calculations. When the HAT database is saved to a file, the internal numbers are converted to a sequence of decimal characters, with the number of decimals as specified for this value field. If the number of decimals is set to 2, all the decimals to the right of the second decimal will be truncated. The practical effect will be that the number will be cleaned from small deviances due to accumulated rounding errors.

Many softwares that do a lot of calculations saves the data in floating format, and solves the problem of erroneous decimals at “the tail end” by simply showing the relevant decimals part, only. This works rather well if the software does a small number of calculations. The small errors will then never get a chance to accumulate to affect the really relevant digits. Excel is an example of this strategy.

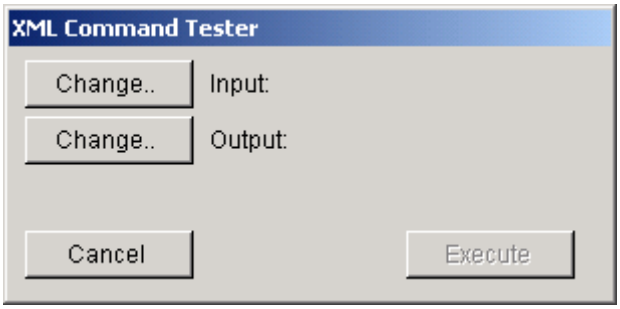
But one of the prominent features of HAT is its capability to process thousands and millions of transactions very fast, so HAT benefits of a more elaborate way to “clean” the data from errors. This cleaning is to some extent done during the internal processing of the numbers, and the final cleaning is done when the data are saved to a HAT file. In order to be able to do this cleaning intelligently, HAT must know the number of decimals that is most appropriate for a certain value field.

Intuitively it may be tempting to choose Floating in the Decimals setting, in order to get maximum precision. Actually this will put you at risk to get an *inferior* precision, because HAT then has no input to guide the removal of small errors.

The rule to set Decimals to the natural number of decimals for each value field, is not only simple, it also promotes the best precision.

XML Command Tester ...

This command is relevant only if you have a Server processor connected to your computer. You can then operate HAT with XML input, much like using the Commands Section in a HAT-Text file. HAT can also save the results in XML format. For more technical details, see the link HAT 5 XML Command Reference. The Command Tester allows you to specify which input file to use, and where you want the output file to be located.



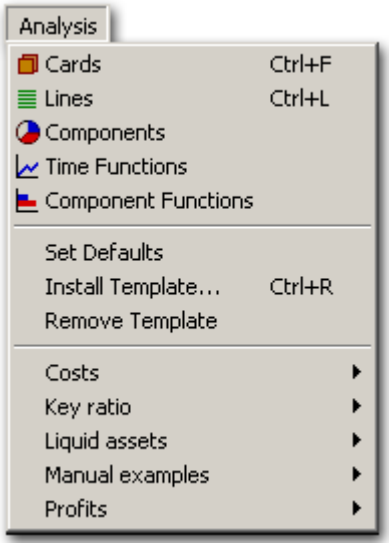
Signature…

You can change the signature which is entered automatically by HAT with this command. Signatures has already been described earlier in this chapter. See section “Signature” on page 83.

7

The Analysis Menu

Overview



Introduction

The Analysis templates are at the very heart of HAT. You use them to get a maximum of information from your HAT database.

This chapter gives a very brief overview of the different analysis template types. A full description of the other elements in the Analysis menu, follow in separate chapters.

Templates overview

Cards

The Cards template is primarily used for inspection of chronological lists of the Cards in the database, either the complete contents or selected parts of the contents.

Lines

In the Lines template you select certain Lines from the database. The selected values are listed by transaction in chronological order. The separate transaction values and/or the accumulated values are displayed. It can also be presented graphically. A number of summary values for the whole set of values can be calculated, based on the selection: number of Lines, maximum and minimum values, turnover time, accrued interest at different rates, etc.

Components

Components calculates and presents a subset of data as a function of a dimension. You can easily change between many views/dimensions. The result can be displayed as a numerical table, or as a pie charts.

Time Functions

Time functions calculates and presents data as functions of time. In a way it is a much more advanced version of the Lines template. You typically add values by period, e.g. costs per month. Or accumulate these values over time, e.g. costs accumulated over time. You are free to set the level of aggregation, by using different time resolutions – from the very detailed view of showing each single transaction (equivalent to Lines, above) to showing aggregates by day, by week etc, up to yearly figures. You can also define your own time scales.

But the most significant aspect is that you can define any number of variables and formulas in Time Functions, in order to calculate deviations from budget, key ratios, and a lot more. The results can be presented graphically or numerically.

Component Functions

If Time Functions is the more advanced version of Lines, the Component Functions template is the advanced analogy of Components. You work with selection variables and formulas, to calculate budget deviances, ratios, and many other measures of you own choice. Instead of presenting the results by time, you get them by component. The results can be listed or displayed graphically.

Set Defaults

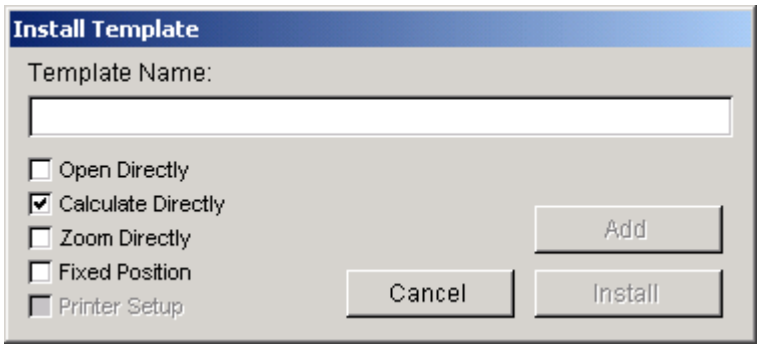
When you open any of the five different templates, it has some default settings. The very first time, these are set by the system. But you can change them at any time, to suit your needs better.

If you have a template in an active window with certain settings, and activate the Set Defaults command, all these settings will be stored for the corresponding template type. Window size, entries in the dimension boxes, etc – they all turn up in a new template.

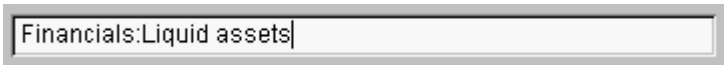
Install Template

When you have defined an analysis template, you may want to store it as a ”standard report”, to be available at any time in the future. Install Template allows you to do that.

If you have a template in an active window, and activate the Install Template command, you get the following dialogue window:



Template Name. The template can be given any name, consisting of alphanumerical characters. Often you prefer to put them in logical groups, e. g. all financial reports under the heading ”Financials”. You achieve this by using the colon character (:) between the intended group levels. E.g.



will create the group Financials, which has the sub template Liquid assets in it. If we later install a template with the name Financials: Loans, it will turn up in the same group.

Open Directly. The template will be automatically displayed when you open the HAT database. Use it for templates you should not forget to look at, templates used as reminders of ”things to do”, or to convey a message to a colleague who will work with the HAT-file, etc.

Calculate Directly. If this box is not marked, you will have to press the Calc button, to get the final report. This is usually ticked, but it may happen that the selection in the template will always be somewhat changed before it is calculated. If the database is very large, you may prefer to postpone a time consuming calculation until the result is relevant.

Zoom Directly. The template will be zoomed directly when activated.

Fixed Position. The template will, when opened, be positioned on the screen exactly as when it was installed.

Printer Setup. The current Printer Setup will be installed with the template. This is an often quicker way to achieve the same result as if you change this setup in the Printing definition page, and then install the template. It is also easily available from a Macro script.

Add. If you make any changes to an already installed template, and click on the Install button, the template will be changed. If you want to install the new version, and keep the old one as before, you should change the name of the template, and click the Add button.

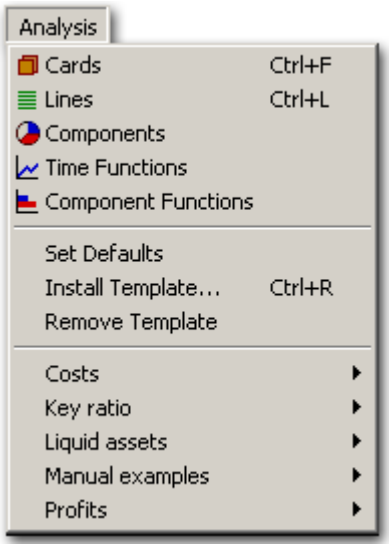
Remove Template

Remove Template lets you delete an installed template, provided that it is *active*. A dialogue window will be displayed, giving you a last chance to change your mind.

8

Analysis Templates

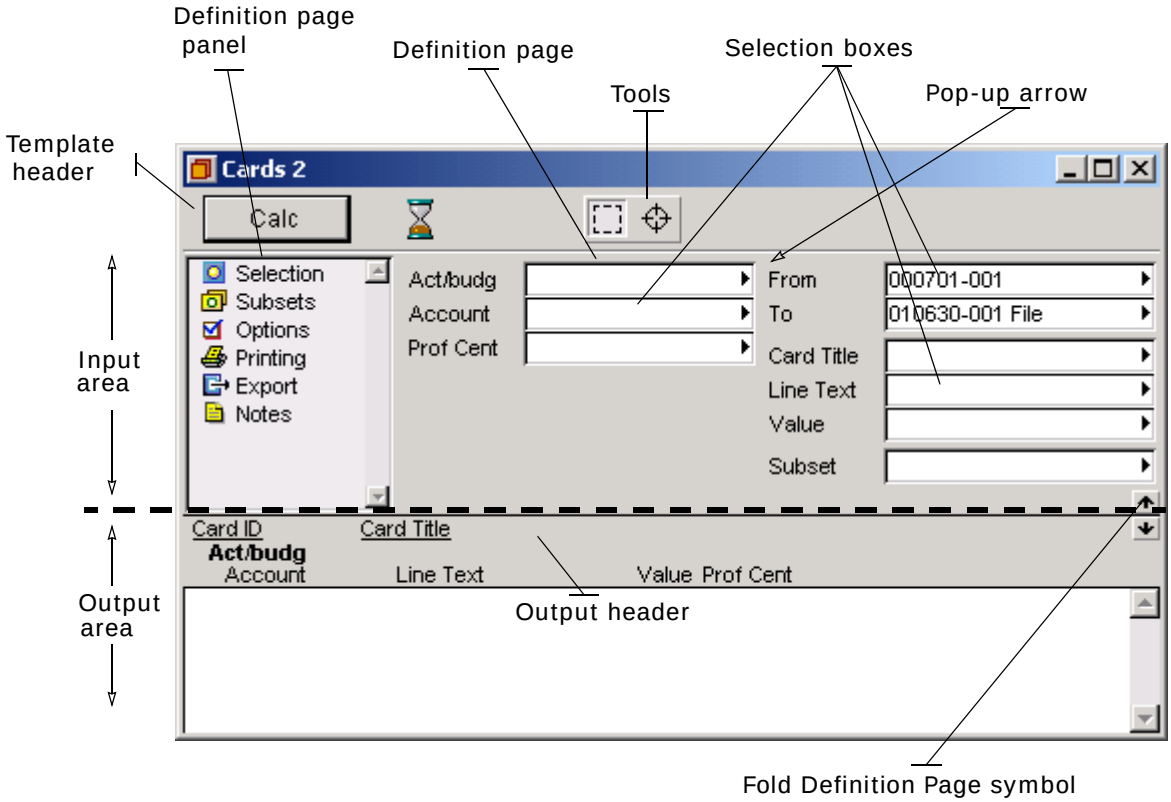
Common features



Introduction

The Analysis template

The five template types differ in their layout, but some parts are almost identical. The following picture shows how it typically looks, with the most prominent definition page (Selection) active:



Definition page panel

Each type of analysis template has a number of different definition pages, where you can define what data you would like to see, and how they are presented. Use this panel to switch between different definition pages.

The Calc button

When the button is highlighted you have to press it in order to get the correct output, so it corresponds to the entries you have done on the definition pages.

Selections

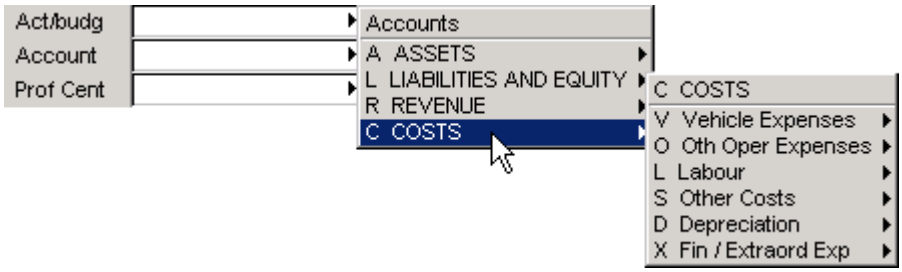
Selection Boxes – Dimensions

Entering single components

There are several tools available for defining selection criteria in a dimension box, e.g. Account. You can use:

- Pop-up arrow menus with mouse control
- Pop-up arrow menus with keyboard control
- Text entry from the keyboard

Selecting with mouse control. By pressing the mouse button on the small arrow to the right in the dimension box, e. g. Accounts, the highest level of account groups will pop up. When you move the cursor to a lower level in the account structure, it will successively unfold. The hierarchical menu has the same structure as the dimension chart:



When you release the button, the highlighted component will be inserted in the box. At first, only the HAT-Code of the component will be displayed, but as soon as you move the cursor elsewhere, also the component text will show up. If you enter an expression with more than one element, e.g. COSTS *or* REVENUES, only the HAT-Codes will be displayed, to save space.

Selecting with keyboard control. You can use the keyboard to unfold the dimension chart and get the same result:

1. Place the cursor in the dimension box.
2. Press the Ctrl-key and one of the up or down arrow keys.
   The first level of the hierarchical menu will show up.
3. By pressing the arrow keys you can ”walk around” in the tree.
4. When the appropriate component is highlighted, press Enter, and the HAT-Code of this component will be filled in.

Text entry from the keyboard. If you enter a character string in a dimension box, HAT will search for a matching string in the corresponding dimension chart, in the following order:

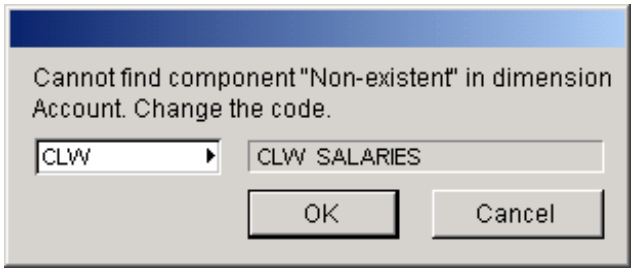
1. Search in HAT-Code.
   The search is performed using only the characters before the first space in the entered string. Matching is sensitive to the character case when the field pro-

perty is set to Case Sensitive, in the Properties setting of the dimension chart. This search returns the component giving an exact match of the HAT-Code. If no such match exists, the search continues among the Host Codes.

2. Search in Host Code. The search uses all the characters, including spaces, of the entered string. Matching is sensitive to the character case when the field property is set to Case Sensitive, in the Properties setting of the dimension chart This search returns the component which matches the entered characters at the beginning of the Host Code. If there are several alternatives, the one with the closest match is returned.
3. Search in the Text field, finally, is done in two phases:
   First, the search is performed using the characters following the first space in the entered string.
   Second, if phase 1 fails, the search is repeated using all characters in the entered string.
   The matching is always Case Insensitive.

Node Finder. If all these types of search fail, a dialogue box (the *Node Finder*), will appear:

You can then enter a code, either by using the pop-up arrow menu, or by entering a text in the field. You see exactly how HAT interprets the text you enter, immediately to the right in the dimension box:

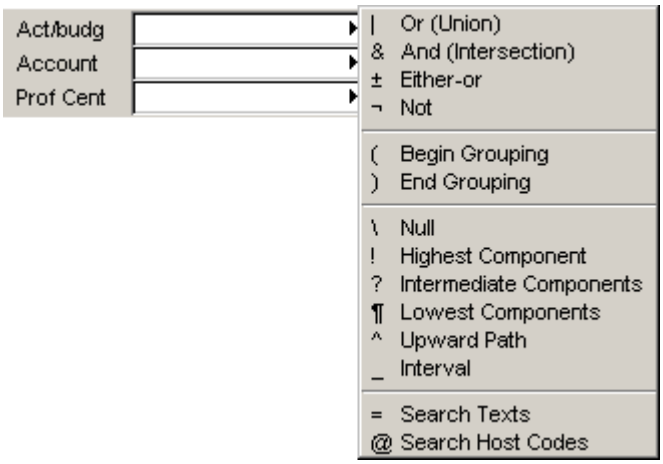


Click the OK button when the intended component shows up.

Entering component expressions, using operators

With operators you can form expressions that combine or exclude components in a dimension box. The operators are available in an pop-up arrow menu, or can be entered directly from the keyboard.

To expose the operator menu, right-click on the pop-up arrow (or use AltGr+left-click):



Release the button on the element you want to enter.

MacOS
To get the corresponding function on Macintosh, press the Alt-key while clicking on the pop-up arrow.

The component operators

Symbol	Name	Other names	Example	Explanation
|	Union	or	C|R	All Lines in the two sets, C and R, together
&	Intersection	and	C&R	All Lines common to the sets C and R
±	Either-or	exclusive or	C±R	All Lines in either of the two sets, but not in both
¬	Complement	not	¬C	All Lines not in the set C
(	Open			Left parenthesis
)	Close			Right parenthesis
\	Null	empty, void	\	All Lines that have no entry at all (in this field)
!	Highest Component		C!	All Lines coded with exactly C, i.e. excluding sub components
?	Intermediate Components		C?	All Lines coded with sub components to C, but not C itself or subcontinents at the lowest level
¶	Lowest Components		C¶	All Lines coded with lowest level subcontinents to C
^	Upward Path		C^	All Lines coded with C, or components above C
_	Interval		CLW_CD	All Lines coded with CLW or CD, or components between these in the dimension chart
=	Search Texts		=commission	Selects all components with texts containing the text string “=commission”
@	Search Host Codes		@101	Selects all components with host codes containing the text string “101”

Convenient quick entries

Three of the operators have the following quick entry formats:

	Entries	Example: Enter	Result
| (Or)	+ + (two plus)	R + + C	R|C
¬ (Not)	– – (two minus)	C – – CD – – CX	C ¬ CD ¬ CX
± (Either-or)	+ – (plus and minus)	ACC ¬ ACC1010 + – ACC ¬ ACC1011	ACC ¬ ACC1010 ± ACC¬ ACC1011

Combining component sets with operators

You can combine several operators and sets. Use parentheses to ensure the correct priority in evaluating a combination. As always, the expressions within parentheses are evaluated first.

Example C¬(CL|CD) selects accounts belonging to C COSTS, but not CL LABOR COSTS or CD DEPRECIATION

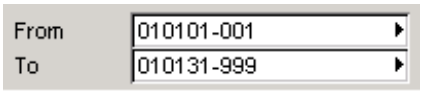
Feed back

Every expression you try to enter in a selection box will be interpreted by HAT. The interpretation will be explicated in the box as soon as you

- leave the box
- press the Enter button
- press the Calc button

Selection Boxes – Time

The time span for the selected Cards or Lines is set in the boxes:



Default time limits. Default time limits are the first and last Cards in the file, unless otherwise specified with the Set defaults command.

Editing time limits

You can change the time limits by editing the Card IDs in the boxes. You do not always have to enter all digits. HAT completes partial entries in accordance with the examples below:

From box. HAT completes partial entries by inserting the *earliest* possible value:

Example

01 is completed as 010101-001.

0101 is completed as 010101-001.

010101 is completed as 010101-001.

To box. HAT completes partial entries by inserting the *latest* possible value:

Example

01 is completed as 011231-999.

0106 is completed as 010630-999.

010630 is completed as 010630-999.

The time operators

By intelligent use of time operators to define period limits, you can gain some advantages:

- Easier to enter dates which you may not know in advance.
- Allow “dynamic” definitions of analysis templates.

HAT is rather forgiving when interpreting what you enter in a time box. E.g. if you enter f, fi, or files in a time box, HAT interprets them all as File.

The examples in this table assumes that ”today” is July 1st 2001:

Short name	Full name	Enter the short name, and HAT will enter in From box	Enter the short name, and HAT will enter in To box	Explanation
f	File	010101-001 File	011101-003 File	Beginning and End of file
r	Reference	010301-001 Refer-ence	010301-001 Refer-ence	As set in Database Set-tings
y	Year	010101-001 Year	011231-999 Year	Current year
m	Month	010701-001 Month	010731-999 Month	Current month
w	Week	010625-001 Week	010701-999 Week	Current week
d	Day	010701-001 Day	010701-999 Day	Current day

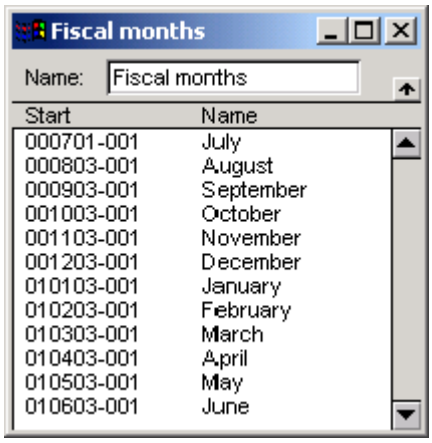
Time offsets

For the operators *referring to the current time period* (day, week, etc.), you also have the option to set the time back or forth, by entering a signed numeral in addition to the operator. E.g. if the current date is July 1st 2001, you will get the following effects:

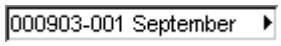
Expression	HAT Interpretation	Entered in From box	Entered in In To box
d-1	Yesterday	010630-001 Day-1	010630-999 Day-1
w+1	Next week	010702-001 Week+1	010708-999 Week+1
m-1	Last month	010601-001 Month-1	010630-999 Month-1
y-1	Last year	000101-001 Year-1	001231-999 Year-1

Using your own Time Scales

If you have defined a Time Scale (in the Database menu), you can use its constituent time periods in a similar way as the time operators. If the time scale is Fiscal Months (see below),



you can refer to these by their period names.
E.g. if 'sept' is entered in the From time box, you get



See section "Time Scales" on page 87, for more details on how to create your own Time Scales.

Selection Boxes – Text

Text search in HAT is very fast and flexible. It allows you to search for a specific Card or "filter out" e.g. all Card texts that has a certain supplier name or number in it. The option to define very complex searches has a certain price, in terms of making it somewhat more difficult to use. In order to make life as easy as possible, without sacrificing the sophisticated functionality in cases where it is needed, text search in HAT is split into two levels – simple text search and advanced text search.

Both kinds of text search applies to the Card Title and Line Text boxes.

If you simply enter any string of text, it will by default be conceived as part of a simple text search. This is by far the most frequent way of using text search. When simple text search does not do the job, you invoke advanced text search by starting the search string with the \-character.

Simple search texts

If you enter a string of characters in a text box (Card Title or Line Text), and press the Calc button, HAT will select all entries that contain the entered text string anywhere in the target text. The search is not case-sensitive, i.e. the search strings 'shop', 'SHOP', or 'shOP' will all define the same selection. Each will, by itself, find the strings 'Barber Shop' and 'bishop'. All characters are allowed in a simple search text, with a few exceptions – the logical operators |, ±, &, ¬,

and the parentheses ( ) have a special status, for the very reason that they are logical operators and parentheses. Also, the backslash character (\) is reserved to indicate advanced text search, so it should not be used as a leading character, either.
By combining simple search texts with logical operators, you get logical expressions that implement somewhat more advanced forms of simple text searches.

Example

If you enter the string

(bar&ho)|bi

in a text selection box, the strings 'Barber Shop' and 'Bishop' will both be found.

The logical operators basically have the same meaning as in other parts of HAT.

Advanced search texts

Sometimes more complex searches are required. E.g. you want a selection based on exactly the string "Ltd", in order to select all companies of this type. To get maximum precision you want the first letter to be a capital L. But in simple search texts, the difference between capital and small letters is not significant. You have to use advanced search texts.

In this example the search text would look like this:

\^Ltd

The ^-character just before the L, means that exactly this letter (not the others) has to be a *capital* letter.

The \-character acts as flag, telling HAT that the characters that follow should be regarded as an advanced search string. The following characters will, when occurring after the back-slash sign, get a special meaning:

Symbol	Meaning	Example	Will find	Will not find
*	any text string	*age	storage, CAGE	ageing, cages
?	any (single) character	\?wan	swan, Ewan	Taiwan, wanted
^	case (capital/small letter) is significant	^Ltd	Ltd, LTD	ltd, lTD
{ }	groups many characters	^{Ltd}	Ltd	LTD, ltd, lTD
;	separates strings, of which at least one must match	\lon*;*ful	lonely, joyful	alone, fullfilment
:	after characters that occur consecutively, zero or many times	\a:bc	BC, abc, aaabc	abb, abcc
+	after characters that occur consecutively, one or many times	\a+bc	abc, aabc, AaABc	BC
_	interval	\a{b_f}c	aCc, AfC	akc, ABF
' '	enclosed characters are pure text	\'a{b}'	a{b}, A{b}	ab, AB
" "	enclosed characters are pure text	\"a'b'c"	a'b'c, a'B'C	abc, a´bc

Please note that in advanced search texts:

- capital and small letters are equivalent, if not explicitly stated otherwise (using the ^-character), just as in simple search texts
- HAT searches for exactly the string stated (but for being case insensitive). E.g. \Ab will find AB, and aB, but not ABC.
  The simple search text

  ab

  and the advanced search text

  ab

  are equivalent, i.e. they will both find ab, aB, Ab, or AB anywhere in the text.

Logical operators

Search texts can be combined by logical operators to form more complex search expressions. The operators

|, &, ±, and¬

all have their usual meaning.

Example The search expression

bus | nav

will find text strings with any of the two strings 'Business' and 'Navigator' in them.

A search text that is preceded by backslash (\), is interpreted as an advanced search text, up to the first logical operator. Thus, it is possible to mix simple and advanced search texts, to a full search expression.

Example The expression

*^{Ltd}&hop

will find Shoplifters Ltd or CHOP CHING Ltd, but not Grasshopper LTD.

Selection Box – Value

Single value field

You can select Lines to be analysed based on numerical values, by entering search criteria in the Value box

Example If you enter 768, the Lines with the exact value 768 will be selected.

You can use the usual logical operators to form a search expression. The logical operators need no further explanation – they work as you expect from their other uses in HAT (see the description of Component operators). Also the interval- and the parentheses-symbols can be used. The relational symbols (<, >, =) can be used as single symbols, or in combination.

As always, HAT exposes its interpretation of what you enter, e.g. if you enter the string '> < 56', HAT responds by changing it to '<>56', as soon as you leave the value box, or press the Calc button.

Example

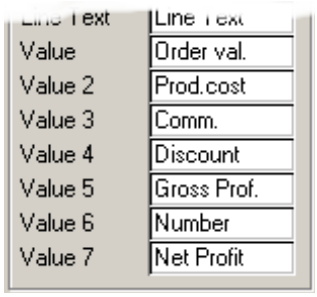
566 | 568	will find all Lines with the exact value 566 or 568
566 & 568	cannot possibly find anything, since one Line only holds one single value
(20_30)¬25	will find all Lines with values in the interval 20…30, except 25
>=50	will find all Lines with values equal to or larger than 50

Multiple value fields

If the data base contains multiple value fields, the basic logic for selections remains. As a HAT database may hold up to 24 different value fields, and you seldom have use for more than a few of these in a given selection, only the ones needed are displayed. The following example shows how it works.

Example

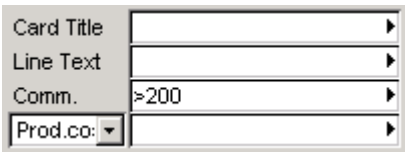
The HAT database has the following seven value fields (as they appear in Database Settings …):



If no selection criterion has been entered for a value field, the selection definition page looks like this:

Instead of the standard name Value, a drop-down menu with the default name Order val. is displayed.

You can change the pop-up to any of the names, without any other changes occurring, e.g. change it to Comm. But if you enter a selection criterion in the box, the field box is “locked” to the Comm. value field. If we then try to change this field to e.g. Gross Prof. the new field will appear one line further down:



In this way the number of value fields expands according to usage.

Working interactively in the output area

This is basically about using the drill down or the selection tools in the template header:

Selection tool  Drill down tool

Using the selection tool

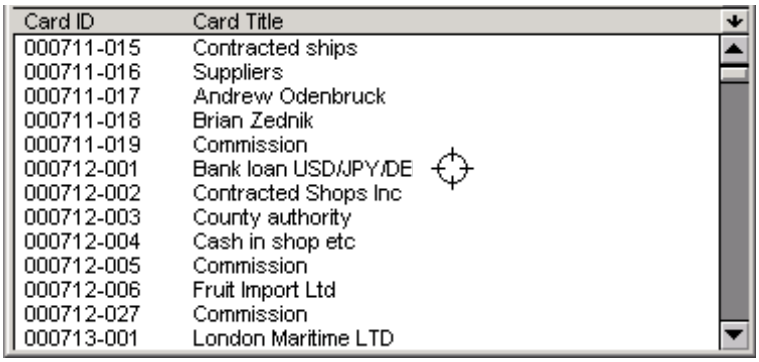
The selection tool allows you to highlight any rectangular area in the output area, in all templates. You can then copy the marked data for use in another context, e.g. an Excel worksheet.

Drill down

The operation to click on a certain element in order to get a more detailed picture of the underlying data i often called “drill down”. The result of a drill down operation differs depending on which template you start from, but you get what you logically expect. To activate this operation, do one of the following:

1. Press the Ctrl-button while the curser is in the output area
2. Click on the drill-down tool in the template header

When you move the cursor over the output area, the arrow will turn into a cross-hair symbol:



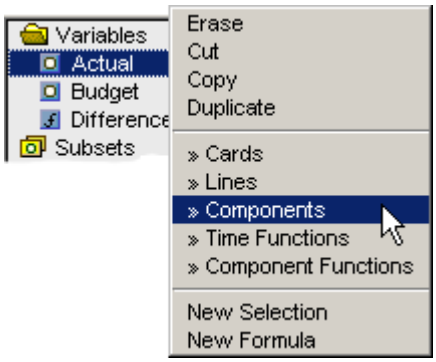
Card ID	Card Title
000711-015	Contracted ships
000711-016	Suppliers
000711-017	Andrew Odenbruck
000711-018	Brian Zednik
000711-019	Commission
000712-001	Bank loan USD/JPY/DE
000712-002	Contracted Shops Inc
000712-003	County authority
000712-004	Cash in shop etc
000712-005	Commission
000712-006	Fruit Import Ltd
000712-027	Commission
000713-001	London Maritime LTD

Clicking will give a full view of the relevant card.

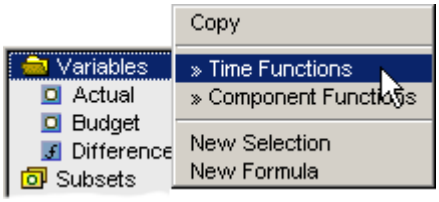
Transition to another template

If you have a template with a selection, you occasionally want to see exactly the same selection presented in another type of template. You always have the option to copy the definition of a single selection, or copy an entire group of variables and paste it into another template.You can achieve the same result in a simpler way by doing a direct transition, from a selection or full variable group,

to another template. The transition is initiated with a right-click on a singel selection,



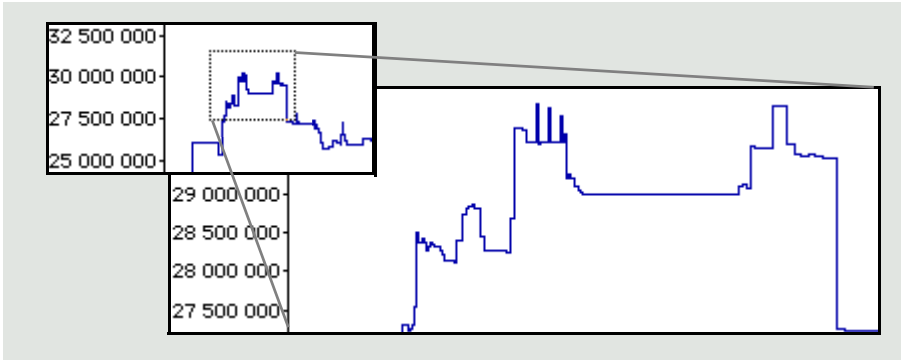
or, as in this case, on a variables group:



The new template inherits all the relevant attributes, including subsets.

Enlarging by dragging

When you drag to mark an area with the magnifier glass, the area is enlarged to the new view.



Reducing Charts

By pressing the AltGr-key, the cursor changes appearance from a magnifying glass to a ”reduction glass”. You can thus reverse the magnification. A more direct method is to change cursor mode to the “reduction glass”, from the cursor tools

Note that you can also reduce by dragging. Try it, and you will quickly find out how it works.

Stepwise enlargement – fly-in mode

In the Lines or Time Functions template you can invoke a stepwise enlargement of a graphical view. With the magnifying glass active, point on the graph, press the mouse button for three or more seconds and you will get a stepwise “inflight” with a series of incremental enlargements. Use the reduction glass the get the opposite effect.

Special case

In Component Functions, enlarging and reducing only works in one direction, along the value axis.

Rounding when exporting and copying tables

Rounded values will be exported and copied in their displayed format, if they are rounded to zero or more decimals. If rounded to -3 or -6 decimals, they are exported as if they were rounded to zero decimals. This may seem illogical at first sight, but you usually want to do any rounding in the target application of e.g. a paste operation.

Table and Chart views

The basic purpose with HAT is to allow the HAT user to exploit the potential information content in a database, easily and efficiently. This also requires that it should be easy to present the results in an optimal way. In one case you want details, e.g. check that the accounts balance, not just roughly, but to the last cent. In other cases you are best served by a broad overview, e.g. yearly sales by product, rounded to nearest thousand, and presented graphically.

Among the different ways to present data in a meaningful way, the most basic distinction is between

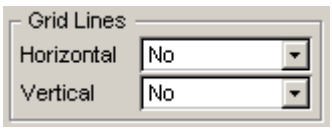
- Table view, i.e. presenting the results in tables, or lists of values
- Chart view, using graphics instead

You can switch between presentation forms with the display tool,

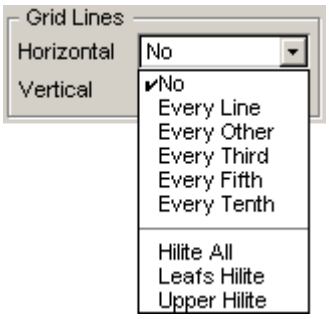
which differs somewhat between the template types. All templates but the Cards template have at least one chart view.

Grid lines

On the Options definition page, in all the analysis templates but Cards, you have the option to improve the readability of data presented in table view:



You can either enter grid lines horizontally between, or display hierarchically different lines with shaded backgrounds:



Vertically the alternatives are: No (vertical lines at all) or Every Column.

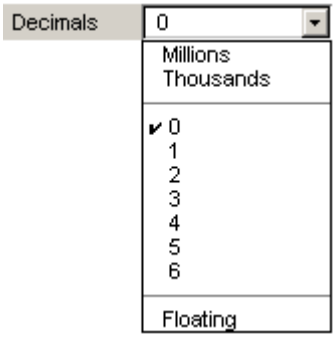
Decimals

You find it on the Options definition page in Cards, Lines, and Components. In Time Functions and Component Functions, it is available on each selection and formula definition page.

Example If you have a number

123456789.123456789

in your HAT database, it will be displayed rounded to the closest number according to the usual rules (i.e. 1-4 are rounded downwards, 5-9 upwards):



If the setting is …	... it is displayed as…
6	123 456 789.123 457
3	123 456 789.123
1	123 456 789.1
0	123 456 789
Thousands	123 457’
Millions	123’’
Floating	123456789,123457

Note that the Decimals setting is only a matter of how the number is *displayed*. Its value in the database is not affected. When the setting Floating is used, HAT displays the maximum number of decimal digits that the computer can store, rounded to nearest decimal value. In this case it displays 15 digits, which is typical for common PCs.

Bastard zeros. In spite of showing a number with maximum precision, i.e. with six decimals, it may look like a zero value, without actually being exactly zero (but very small), because of the rounding.

Value fit and column width adjustment

~~95654,00~~

Value misfit warning. Digits displayed with a double strike out represent a value that does not fit in the column.

Adjusting column width. You can see the column borders by clicking on the column header while holding down the Ctrl key.

The arrow cursor ( ) changes to a column cursor ( ) at all column borders of the header. Drag the column pointer sideways to change the column width. The widths of adjacent columns will not be affected.

If you double-click with the column cursor, the column width will automatically be adjusted.

To adjust all columns simultaneously, use the command Set Column Widths, in the Edit menu.

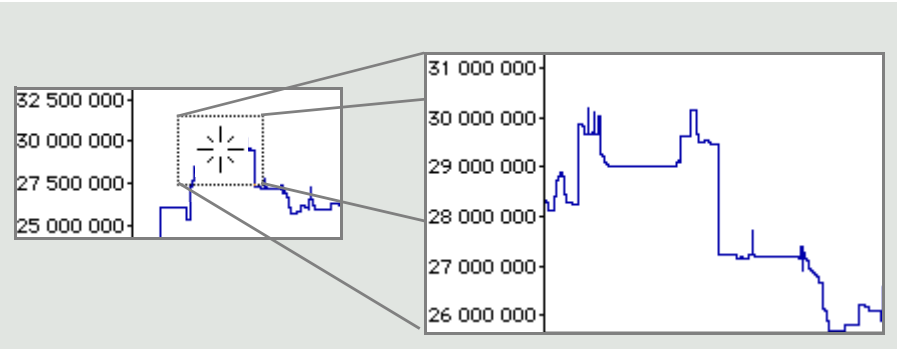
Changing Column order

If the column order is not satisfactory, you can drag columns into new positions. Click (and hold down the mouse button) in the header field you want to move. A dotted border, around this field, will be displayed. Drag the column horizontally to its new place. Its new position is indicated by a vertical bar (▮).

Zooming in charts

Enlarging by clicking

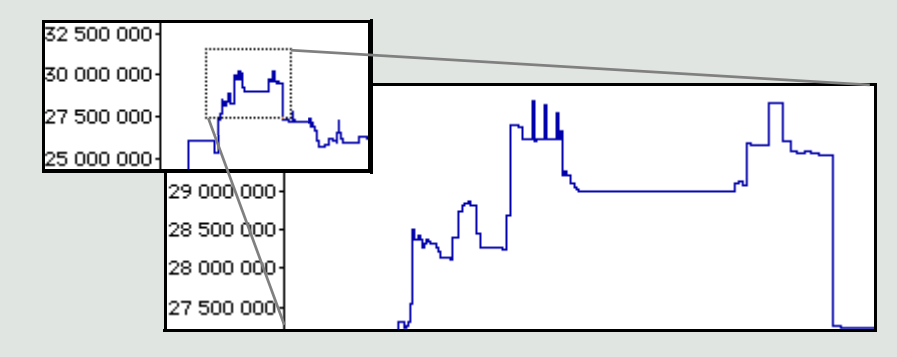
When you place the cursor on a chart area, it will show a magnifying glass. A simple click on a spot will give a new enlarged view (300%)



of the neighbourhood area.

Enlarging by dragging

When you drag to mark an area with the magnifier glass, the area is enlarged to the new view.



Reducing Charts

By pressing the AltGr-key, the cursor changes appearance from a magnifying glass to a ”reduction glass”. You can thus reverse the magnification. A more direct method is to change cursor mode to the “reduction glass” glass, from the cursor tools

Note that you can also reduce by dragging. Try it, and you will quickly find out how it works.

Special case

In Component Functions, enlarging and reducing only works in one direction, along the value axis.

Common definition pages

Each analysis template has a large number of features. They are organized in between six and nine definition pages, depending on type of template. Some definition pages are specific for one type of template, but others are very similar.

The definition pages Subsets, Printing, Export, and Notes basically look the same. The small differences that exist in a few cases, are further commented in the following sections.

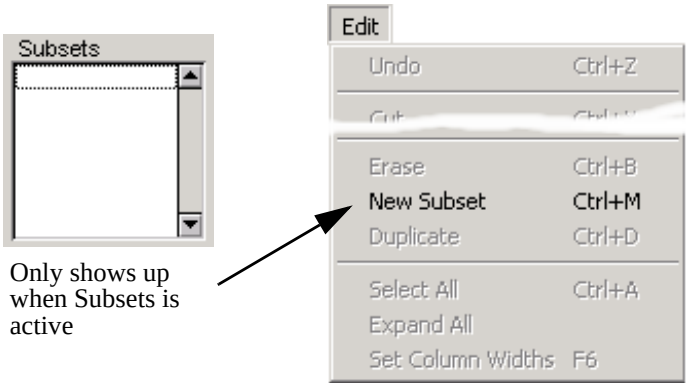
Subsets

This topic has essentially been covered in the section “Subsets” on page 83. The two types of subsets – Global Subsets and Local Subsets, were introduced in that section. These two categories are both called Subsets in HAT, and you work in the same way with both of them. There are two differences between them:

1. Scope. A local subset is entered on a definition page, and is only valid within the template for which it is defined; hence we call it a *Local Subset*.

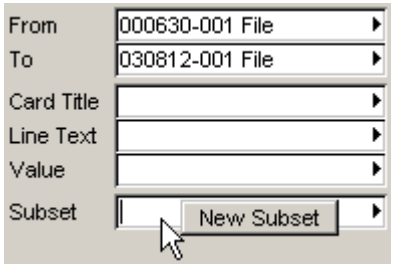
2. Use of other subsets in subset expressions. You can freely use global subsets in expressions defining local subsets, but not the other way around. You can never use subsets from the same category in a subset expression. This would introduce a risk of circular definitions, i. e. subset A is used to define subset B, and subset B is used to define subset A.

On the Subsets definition page you can install a list of subsets. To enter a new subset, press the button New Subset. Note that you can also use the New command in the Edit menu. In order to enter a new subset this way, you have to focus the Subsets list, by clicking anywhere in the list area, which will be highlighted. The command New Subset will then show up:



With New Subset you get a regular subset window (i.e. the same as a subset in the Database menu).

Yet another way to create a new subset, is to right-click in the Subset field, among the selection boxes in the template:



The subset is installed automatically when you close the subset window. You can install any number of subsets, and they all turn up in the Subsets list:

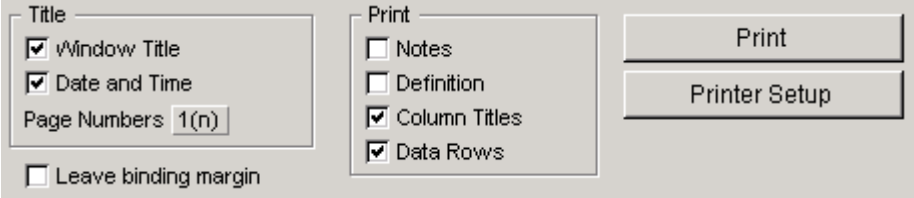
Mark an entry in the list, and the Edit menu will display the options to cut, copy, erase, and duplicate the highlighted subset. These operations can also be performed on any sub collection of subsets:

Select All Highlights all the subsets

Shift-click	Selects a closed interval of subsets
Ctrl-click	Selects two or more non-consecutive subsets

Printing

With one small exception, the Printing definition page always has the following contents:



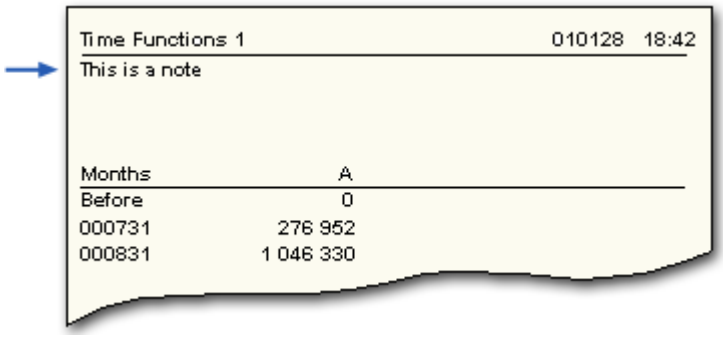
Window Title. The name of the analysis template, as it appears in the window name, will be printed in the upper left corner of the printout.

Date and Time. Will print a date/time stamp in the upper right corner.

Page Numbers. You can choose between how to display the page numbers, if at all. The page numbers will appear in the upper right corner of the document. Regardless of this setting, the page number will not be printed at all, if the there is not more than one page in the printout.

Leave binding margin. HAT will add another centimetre of space in the left margin.

Notes. The text in Notes will be printed below the window title, i.e. use it for written comments to the output.



Definition. Often you would like to see the exact definitions of the selections and formulas, that the printout is based upon.

Column Titles and Data Rows. Are also optional.

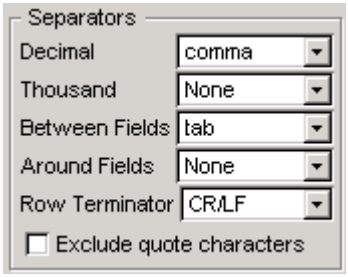
Header Rows. Are only relevant in some templates, e.g. the Lines template when the display mode is Table view.

Export

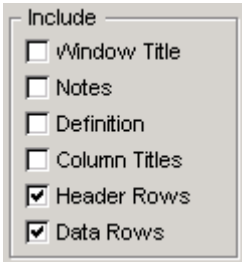
The Export commands are equivalent to the Copy Table and Copy Chart commands. By exporting from an analysis template, you get a separate file.

You have a high degree of control of the format of the exported file.

First the separators that are included (see section “Copy Table.../Copying Options...” on page 48 for further details):



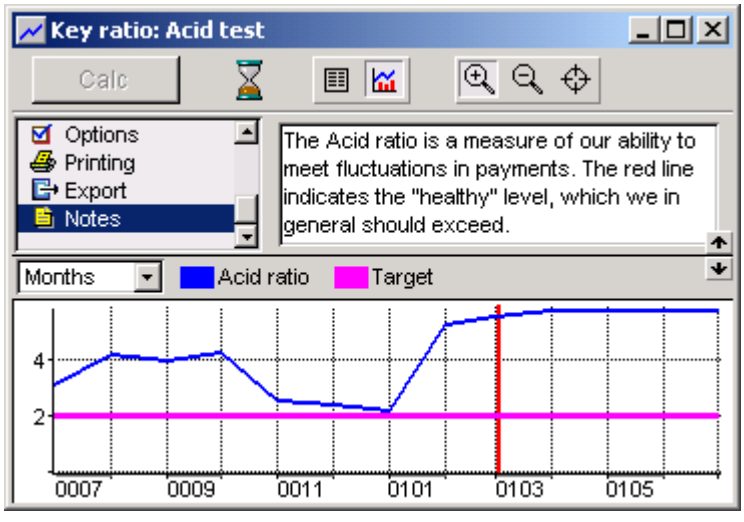
Then, the data that are included:



Export... You can start the exportation in two ways. Either by pressing the Export... button on the definition page, or by choosing Export... from the File menu.

Notes

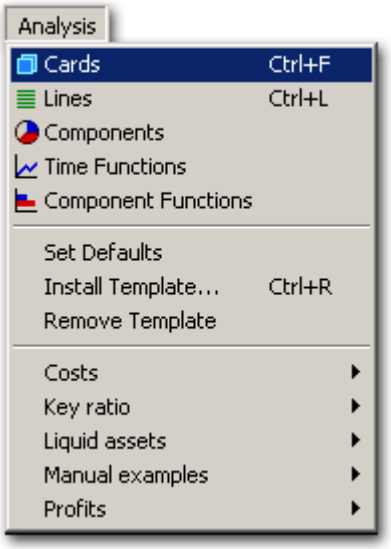
For all types of analysis you can make a note about the contents of the analysis. The notes will be saved when the template is installed. It is sometimes a good idea to install the template with the Notes definition page displayed first:



9

Analysis Templates

Cards



Introduction

The Cards template is the least ”analytical” of the available templates. Still it is often very useful. Exactly how useful depends to a large extent it on what type of data the HAT-file represents. The Cards template is often used to examine the fundamental data in its pure form. The powerful search function in HAT is used to find individual Cards containing certain texts in the Card Title or Line Text field. Or to find a a Card with a certain entry in the Value field.

Definition pages

Selection

See section “Selections” on page 103.

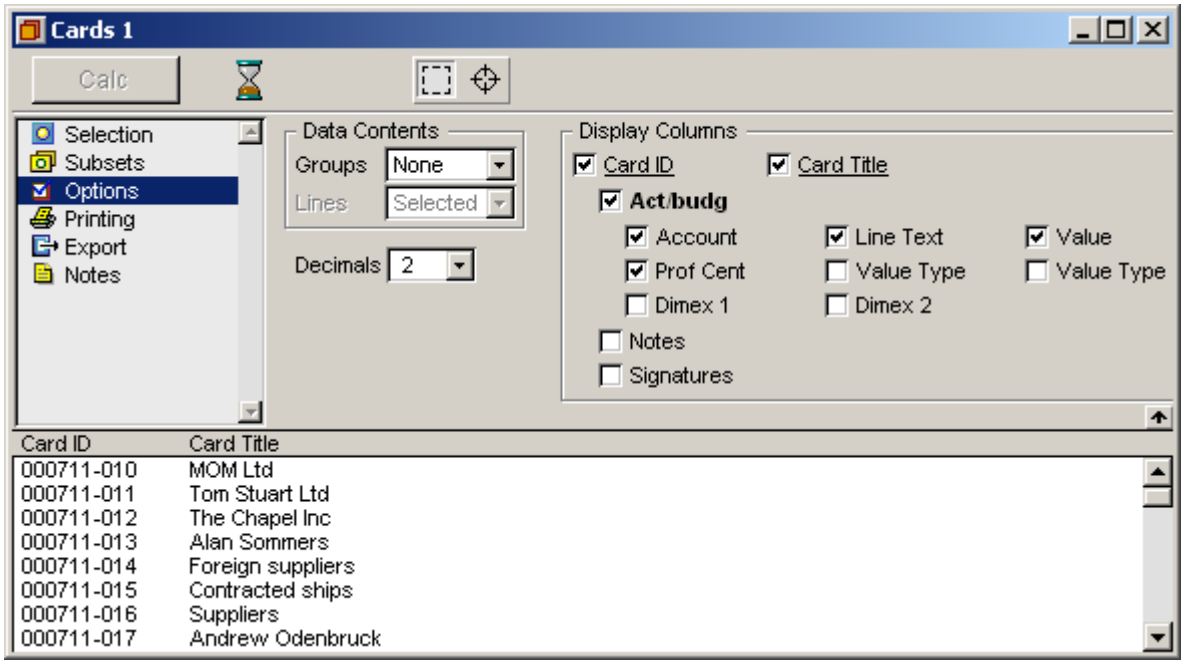
Subsets

See section “Subsets” on page 118.

Options

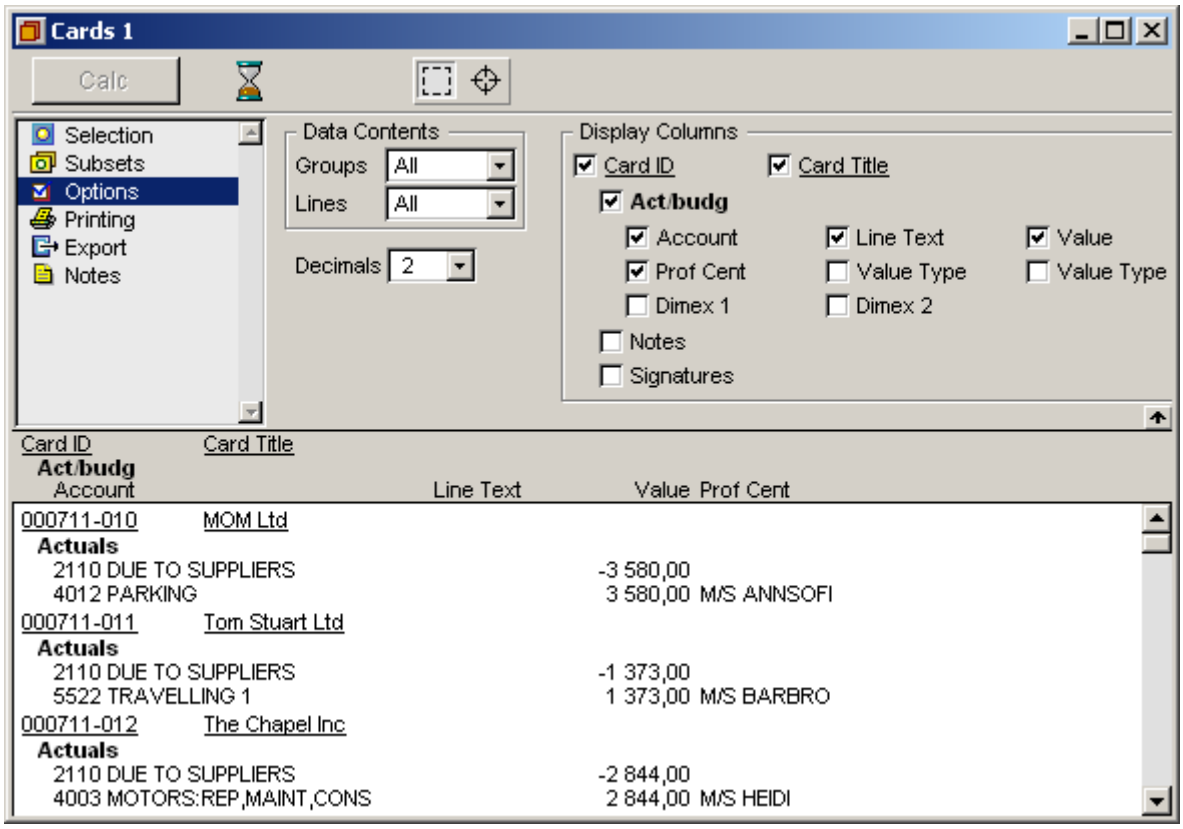
Data Contents

Groups = None. No Groups are listed (and therefore no Lines). The list only contains the Card IDs and Card Titles:

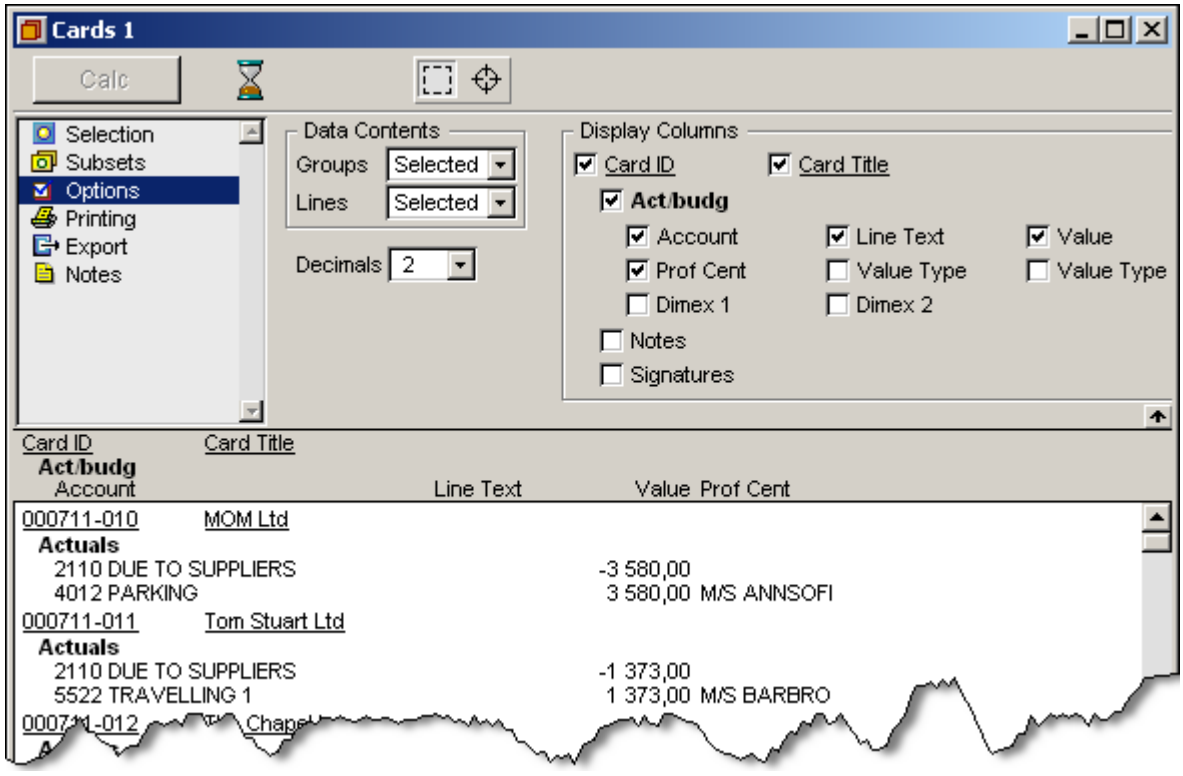


Gives a good overview for inspection of individual Cards.

Groups = All, Lines = All. All information on each Card, but for the Notes area, will be displayed:



A middle road: Groups = Selected, and Lines = Selected.



Exactly the Lines which are included in the selection are displayed, no more and no less.

In all there are nine different combinations of settings available.

Decimals

See section “Decimals” on page 116.

Display Columns

Only the Card elements that are marked will show up.

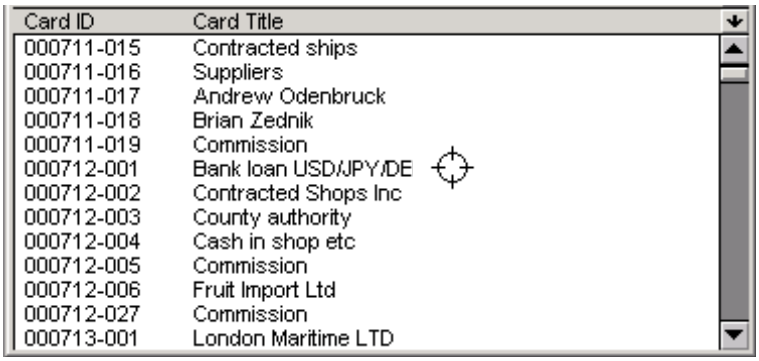
Printing, Export, and Notes

See section “Printing” on page 120, “Export” on page 121, and “Notes” on page 121.

Working interactively in the output area

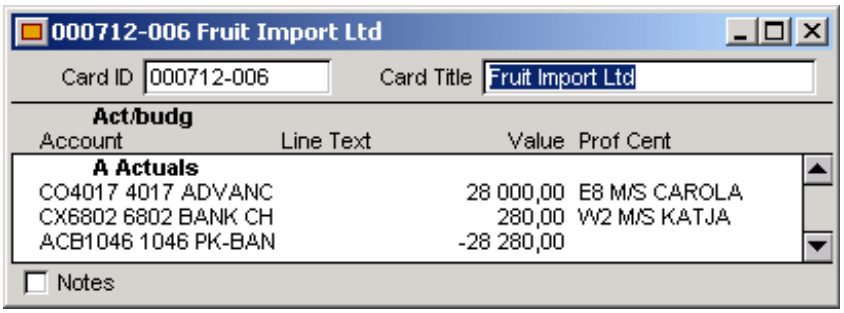
Drill down

In a Cards template you usually interact by pointing and clicking on Card in order to get it fully exposed. For a general description of drill down, see “Drill down” on page 113:



Click on a row in the output area, and the corresponding Card will be displayed, in edit mode.

The individual element you clicked on will be highlighted, i.e. if you click on Fruit Import Ltd, you will get:

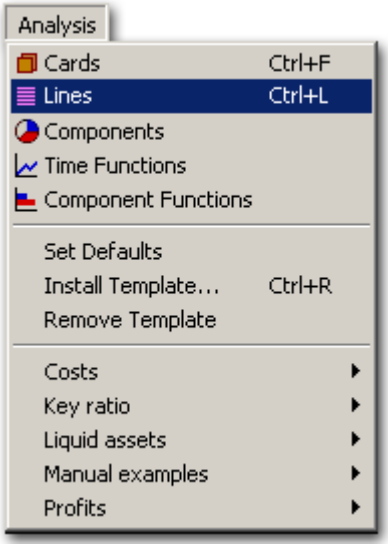


If the Notes area contains text, it will automatically be opened.

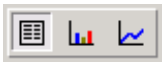
10

Analysis Templates

Lines



Introduction



The general idea with the Lines template, is to select individual Lines from their Cards, and present them in chronological order, in their detailed and ”raw” format. In addition to showing the individual values in lists or graphs, you can also get the accumulated figures. For all its simplicity, it is often very useful. The display tool in the template header area allows you to display three different views:

Table view, where you can see the individual values, and their accumulated values in two parallel columns

First chart view, showing the individual values in a bar chart.

Second chart view, which shows a line graph of the accumulated values

Definition pages

Selection

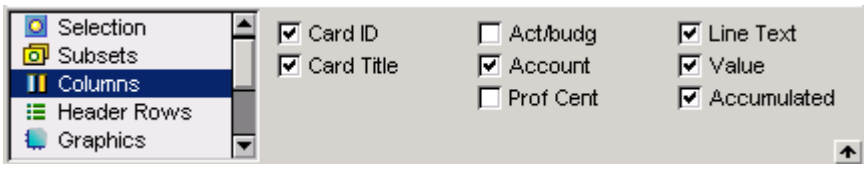
See section “Selections” on page 103.

If the HAT database contains multiple value fields, a drop-down menu will be displayed to the right of the From box. By setting the value in this menu, you decide which value type will be shown in the column Accumulated.

Subsets

See section “Subsets” on page 118.

Columns

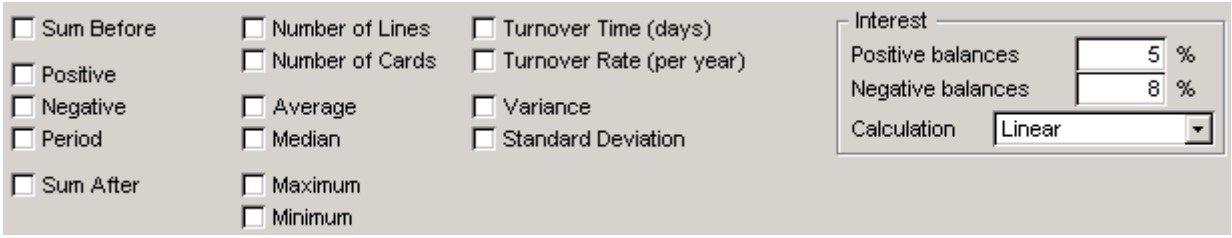


Choose the Columns you want to be displayed.

If the HAT database contains multiple value fields, these value fields will be included in the options.

Header Rows

In Header Rows you can include general measures based on the contents of all the Lines in the list. The values will show up in a number of header lines in the



first part of the output area. If all the entries are ticked it may look like this:

Card Title	Account	Value	Accumulated
Sum Before:		3 870 563,40	
Positive:		4 660 951,65	
Negative:		-207 585,80	
Period:		4 453 365,85	8 323 929,25
Sum After:		0	8 323 929,25
Number of Lines:		143	
Number of Cards:		43	
Average:		31 142,42	7 141 050,42
Median:		1 200,00	
Maximum:		264 236,00	8 346 771,25
Minimum:		-30 138,00	3 870 563,40
Turnover Time (days):		800,86	
Turnover Rate (per year):		0,46	
Variance:		4 080 647 409,05	
Standard Deviation:		63 879,95	
Interest (+):	5 %	267 055,72	
Interest (-):	8 %	0	
Paym Rent	5522 TRAVELL	505,00	3 871 068,40
Andrew Levin & Son	5522 TRAVELL	570,00	3 871 638,40
Andrew Levin & Son	5760 OTH PERS	207,00	3 871 845,40
Alan Sommers	5522 TRAVELL	1 439,00	3 873 284,40
Paym Ollie Wholesale	5522 TRAVELL	351,00	3 873 635,40
Ser. C: Sept-89	5010 WAGES L	197 468,00	4 071 103,40
Ser. C: Sept-89	5011 NON-RECI	734,00	4 071 837,40

Sum Before. Net opening balance, i.e. the sum of all Line values which match the selection, and occur before the specified time period.

Positive. Sum of all positive values in the period.

Negative. Sum of all negative values in the period.

Period.

First column: Net sum of all values in the period.
Second column: Includes the value of the entry balance, also.

Sum After.
First column: The sum of all Line values that occur after the end of the specified time period.

Second column: The first column plus the Sum After-value, i.e. it amounts to the sum of all Line values, from the first to the last in the file (which satisfy all other selection criteria, but for the time period).

Maximum. Returns values in two columns. The first number is the maximum value of all single values. The second number is the maximum value of all accumulated values.

Minimum. Analogous to Maximum.

Average. Returns values in two columns.

The first column value is the average value of all single values.

The second column value needs some further explanation. Mathematically it is the weighted average value of the accumulated values, where the weight for each value is its time span.

Example If you have $20 in cash during the first week, and $10 during the following four week period, on average you had a balance of $12; calculated as (20x1+10x4)/5.

Median. If you rank order all the transactions in a selection according to their value, and identify the one in the very middle of the list, the corresponding value is the medium value. If there are an odd number of transactions in the selection there is exactly one such value. If not, the common convention of calculating the median as the average of the two middle values, is used in HAT.

Number of Lines. Returns the number of Lines in the list.

Number of Cards. Returns the number of Cards in the list

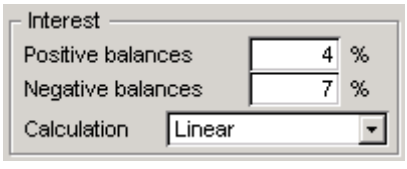
Turnover Time (days). The average lifetime in days of a value unit during the period.

Example Assume we have an average inventory level of 100 units during a period. During the same period we have on average filled up and delivered 5 units a day. The average time each unit stays in the inventory has been 100/5=20 days.

Turnover Rate (per year). The average number of times the average value turns over per year. The relation to Turnover Time is this:

$$\text{Turnover Rate} = \frac{365}{\text{Turnover Time}}$$

Interest. The interest rates entered in the boxes Positive balances and Negative balances are applied to the accumulated values. For every time span with unchanged accumulated value, the first interest is applied if the balance is positive, and the second is applied if it is negative.



Example If you have a cheque account with a credit option, you normally get a lower interest on positive balances, and pay a larger interest on negative ones. If the Lines template includes the entry balance and the transactions, you will get the total interest value, split into positive and negative balances.

Variance. Is a measure of the spread among the line values. The variance of a set of values is the mean squared deviation from the average. It is mathematically defined by the following formula:

$$\sigma^2 = \frac{\Sigma(x-\bar{x})^2}{N}$$

In the area of statistical inference you distinguish between the population variance (σ^2) and the variance in a sample from a population (s^2). When you want to use the sample to get the best estimate of the variance of a larger population($\hat{\sigma}^2$), you should transform the calculated variance as follows:

$$\hat{\sigma}^2 = s^2 \cdot \frac{n}{n-1}$$

where n is the number of line values and s^2 is the variance measure that HAT produces (but now denoted as it usually is, when it is interpreted as a sample measure).

Standard Deviation. Corresponds closely to the variance measure, as it is simply the square root of the variance.

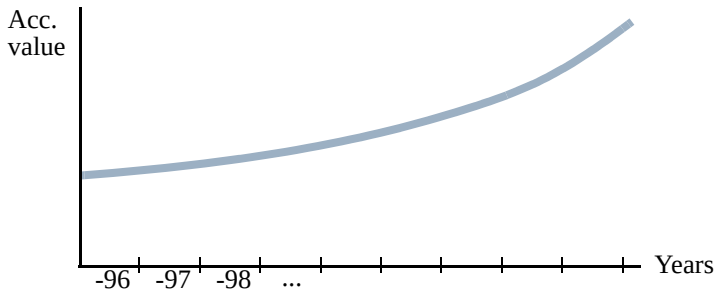
If you interpret it as the standard deviation s of a sample from a larger population you should transform it according to this formula

$$\hat{\sigma} = s \cdot \sqrt{\frac{n}{n-1}}$$

in order to get the best estimate.

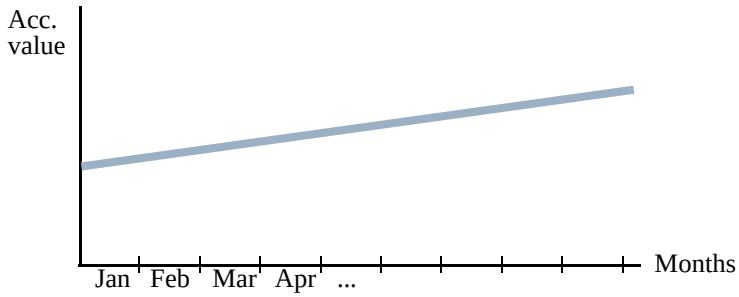
✔Linear
Exponential

Linear or Exponential calculation. Depending on the terms of a loan or a bank account, interest is calculated in different ways. Usually the accumulated interest is added to the balance each year, with the effect that the entry balance for the next year changes accordingly. This, in turn, increases or decreases the total interest during the next year (the effect of “interest-on-interest”). Assume that an account starts with a fixed amount, and remains on the account for a number years without any transactions, but for the addition of the interest accumulated during each year. The accumulated values (with the “interest-on-interest” effect) will then develop exponentially. If the initial amount is $100 and the yearly interest rate is 12%, the accumulated value would be $112 after the first year, $125.44 (=112+12%x112) after the second year, etc:



For periods within the same year, the interest is usually (but not always) strictly proportionate to the elapsed time. E.g. if the initial amount is $100 and the yearly

interest rate is 12%, the accrued interest after three months is $3, after six months $6 etc:

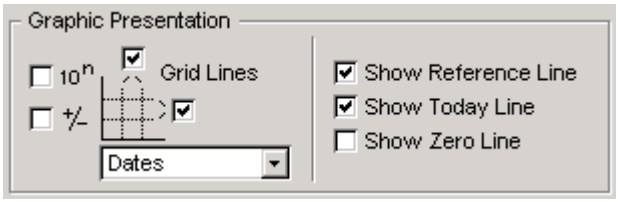


To be able to cover these two cases, HAT offers two methods of calculating the interest:

1. Exponential, which corresponds to the first graph. Use this method if you want to calculate the interest over a number of years (when you want to include the “interest -on-interest” effect). It also gives the correct result for shorter periods if interest is accumulated continuously (which is seldom the case for common bank accounts, but is often relevant in more analytical contexts).
2. Linear, as in the second graph. This model is often appropriate if the period is shorter than a year, or if you separately add one transaction at the end of each year, to account for the accumulated interest during the year.

Graphics

On this definition page you can set a number of options affecting how the graphical charts are presented, and to some extent what is presented:



The common purpose is to make the charts more readable.

10^n. Especially for large numbers it is useful to present numbers in exponential format.

+/-. The value axis direction is reversed. Normally the positive axis points upwards. By clicking this check box the positive axis points downwards. The graphs will be presented, as if all values had the opposite signs. Useful when a lot of negative values are presented.

Grid Lines. Use this option to increase readability of diagrams.

Dates. You can change the time scale to any of the customized ones, provided you have at least one such time scale installed. If no such alternative exists, only the option Date (i.e. HATs own time scale) will be available.

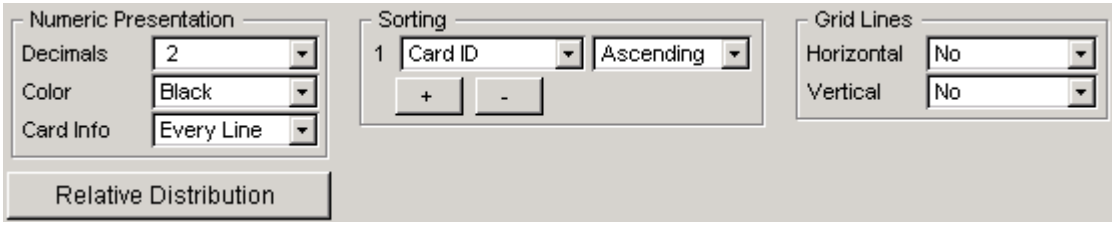
Show Reference Line. A red vertical line will be displayed in the chart at the Reference Point (which you set in Database Settings...)

Show Today Line. A green vertical line is displayed, representing the current date.

Show Zero Line. A dotted horizontal line representing zero, will be displayed. It also ensures that the zero line is always shown in the graph.

Options

Apart from the button Relative Distribution, the settings on this definition page, influence how the Lines template is displayed in table view.



Numeric presentation

Decimals. Number of decimals displayed.

Color. You can choose between three alternatives for displaying positive and negative numbers

	Negative numbers	Positive numbers
Black	**Black**	**Black**
Red/Black	**Red**	**Black**
Red/Green	**Red**	**Green**

Zeroes are always black, regardless of this setting.

Card Info. This setting has two alternatives:

1. Every Line

Card ID	Card Title	Account	Value
000718-019	Martin Ludley	2110 DUE TO SUPPLIERS	-1 200,00
000718-019	Martin Ludley	4012 PARKING	1 200,00
000718-020	Fruit Import Inc	2110 DUE TO SUPPLIERS	-3 081,00
000718-020	Fruit Import Inc	4007 INSPECTION	3 081,00
000718-021	Fruit Import Inc	2110 DUE TO SUPPLIERS	-1 472,00
000718-021	Fruit Import Inc	4007 INSPECTION	1 472,00
000718-022	Sunes Ltd	2110 DUE TO SUPPLIERS	-42 000,00
000718-022	Sunes Ltd	1398 BB TRANSPORTS HB	42 000,00
000718-023	Cliffhanger Brothers	2110 DUE TO SUPPLIERS	-4 184,00
000718-023	Cliffhanger Brothers	4012 PARKING	845,00
000718-023	Cliffhanger Brothers	4012 PARKING	1 749,00
000718-023	Cliffhanger Brothers	4012 PARKING	1 590,00
000718-024	Gothenburg Area	2110 DUE TO SUPPLIERS	-2 255,00
000718-024	Gothenburg Area	4012 PARKING	2 255,00

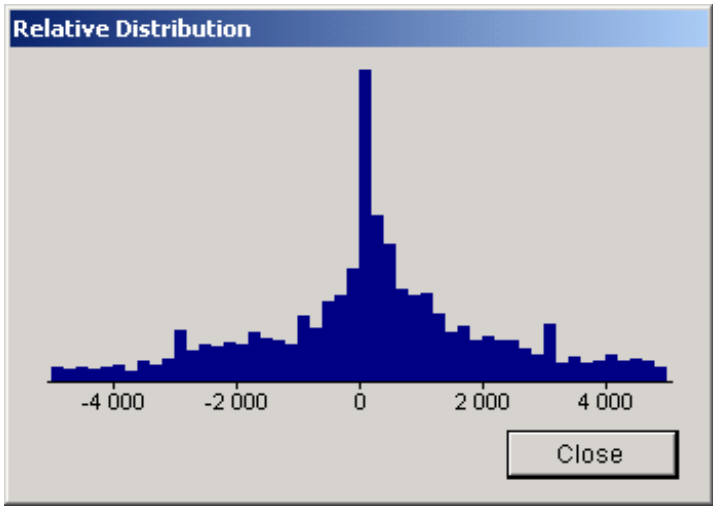
The Card Info (i.e. Card ID and Card Title) is repeated for every Line item.

2. First Line shows the Card Info only for the first line item, from the same Card:

Card ID	Card Title	Account	Value
000718-019	Martin Ludley	2110 DUE TO SUPPLIERS	-1 200,00
		4012 PARKING	1 200,00
000718-020	Fruit Import Inc	2110 DUE TO SUPPLIERS	-3 081,00
		4007 INSPECTION	3 081,00
000718-021	Fruit Import Inc	2110 DUE TO SUPPLIERS	-1 472,00
		4007 INSPECTION	1 472,00
000718-022	Sunes Ltd	2110 DUE TO SUPPLIERS	-42 000,00
		1398 BB TRANSPORTS HB	42 000,00
000718-023	Cliffhanger Brothers	2110 DUE TO SUPPLIERS	-4 184,00
		4012 PARKING	845,00
		4012 PARKING	1 749,00
		4012 PARKING	1 590,00
000718-024	Gothenburg Area	2110 DUE TO SUPPLIERS	-2 255,00
		4012 PARKING	2 255,00

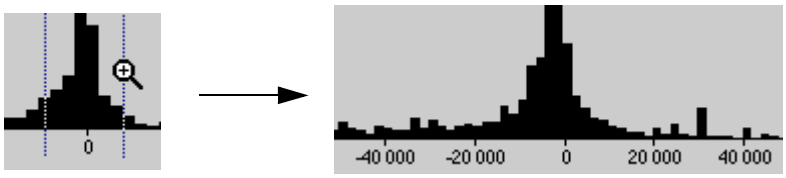
Relative Distribution

When you push this button a frequency diagram will be displayed in a separate window



It shows how frequent different values are in the selection. You can enlarge the diagram in two ways:

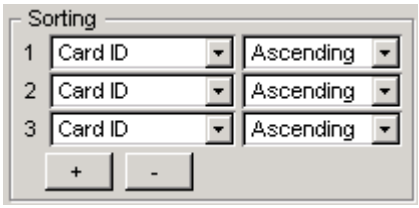
1. By clicking in the graph, with the magnifier
2. By pointing and dragging, over the area of further interest.



3. With the AltGr-key you modify the magnifying glass to – i.e. the reversed function.

Sorting

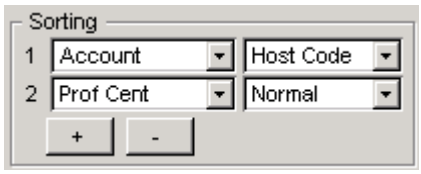
Allows you to show the Lines items in a multitude of different sorting orders. By default they are sorted by ascending Card IDs. But you can reverse this order, or sort them along any number of sorting keys.
By clicking on the plus button (+), you can add as many sorting keys as you want. Clicking on the minus button deletes the last sorting key.



The numbers to the left (1, 2, 3) indicate the hierarchical order between the sorting keys. Choose which sorting criteria you want at each level. Depending on the nature of the criteria, you can then decide what sorting order you want to follow.

Example

With the following settings,



you will get the Lines in the selection, first ordered by Host Code, then by the sorting order as it is defined in the dimension chart (which is called Normal).

The result may look someting like this:

Account ▲1	Prof Cent ▲2	Value	Accumulated
4001 WATER PANTRY WASHING	M/S HEIDI	570,61	13 983,85
4001 WATER PANTRY WASHING	M/S HEIDI	3 614,16	17 598,01
4001 WATER PANTRY WASHING	M/S HEIDI	274,74	17 872,75
4001 WATER PANTRY WASHING	M/S HEIDI	1 054,00	18 926,75
4001 WATER PANTRY WASHING	M/S HEIDI	500,00	19 426,75
4001 WATER PANTRY WASHING	M/S HEIDI	1 128,76	20 555,51
4001 WATER PANTRY WASHING	M/S HEIDI	616,00	21 171,51
4001 WATER PANTRY WASHING	M/S HEIDI	420,00	21 591,51
4001 WATER PANTRY WASHING	M/S HEIDI	305,00	21 896,51
4001 WATER PANTRY WASHING	M/S KATJA	228,02	22 124,53
4001 WATER PANTRY WASHING	M/S KATJA	528,84	22 653,37
4001 WATER PANTRY WASHING	M/S KATJA	-228,02	22 425,35
4001 WATER PANTRY WASHING	M/S KATJA	1 170,00	23 595,35
4001 WATER PANTRY WASHING	M/S KATJA	1 425,00	25 020,35

Note that a number indicating the level of the sorting key (1 and 2), is displayed adjacent to each sorting symbol.

In many cases you have the option to reverse the order. A simple way to achieve this is to click on the sorting symbol, in the Lines header:

Grid Lines

See section “Grid lines” on page 115.

Printing, Export, and Notes

See section “Printing” on page 120, “Export” on page 121, and “Notes” on page 121.

Working interactively in the output area

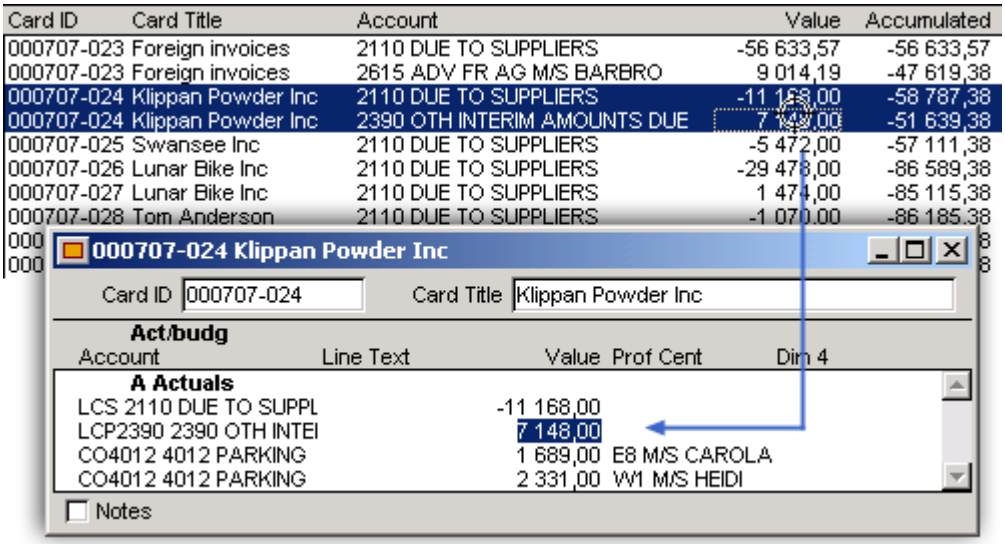
You expose further details by clicking or dragging in the output area.
The point-and-click operation can be used in all display modes – table view and the two variants of chart view.
In chart view you can use the drag operation to define a list of cards, by marking a part of the output area.

To signal that these operations will take place if you click or drag, the cursor turns into a cross-hair symbol. When data are displayed in table view, this happens by default already when you move the cursor over the output area, as this is a very common operation. When the data are presented in any of the chart modes, the default operation when you click or drag is the zoom operation. You then have to press the Ctrl-button to modify the cursor to a cross hair-symbol or select it from the tool bar.

If you want to select data from the output area, you can use the select tool. It allows you to select any rectangle of data, texts and numbers, usually with the purpose to copy and past the data.

Table view

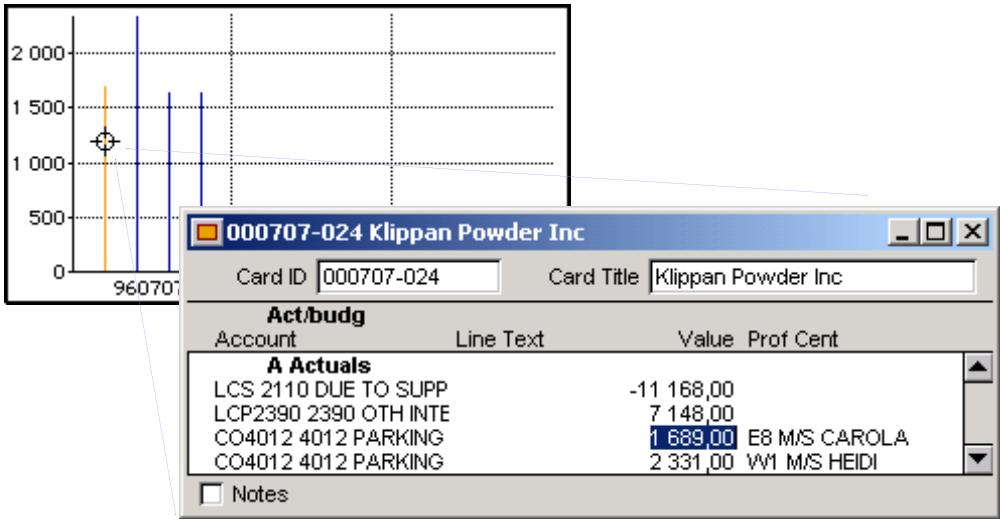
Click on any item and you will get the corresponding Card displayed,



with a highlight of the field you pointed at:

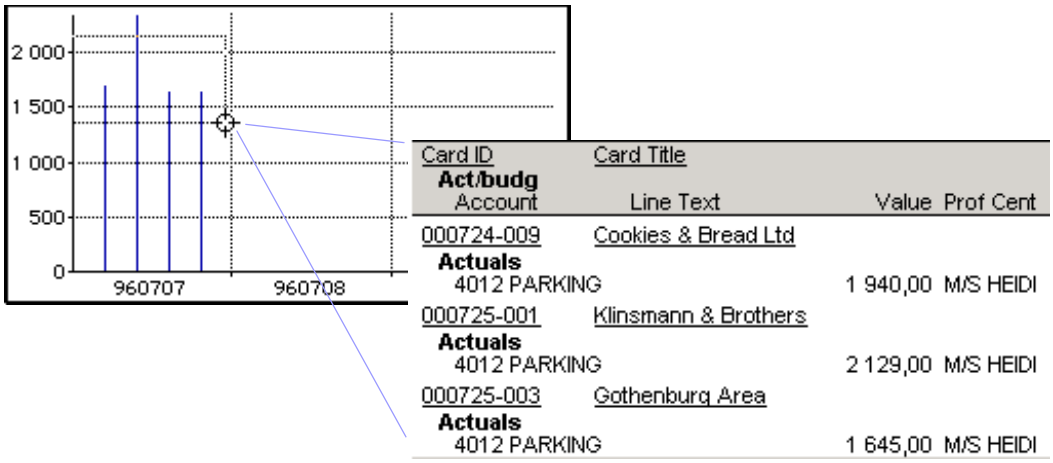
Chart view – Bar chart

Point-and-click operation. The mechanism is almost the same as in table



view. With the difference that you have to press the Ctrl-key to change the arrow cursor to the cross hair. If you click on a bar, it will correspond to clicking on the Line value in table view.

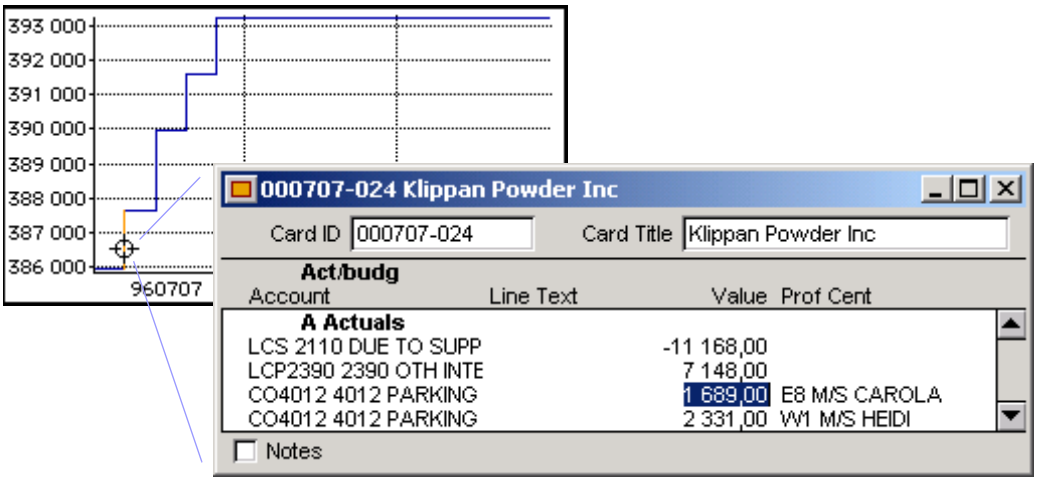
Drag operation. In chart view you can drag over a number of transactions and get a list of them:



The transactions/bars which have their top ends in the marked area, are selected and displayed in a Cards template, with exactly these transactions selected.

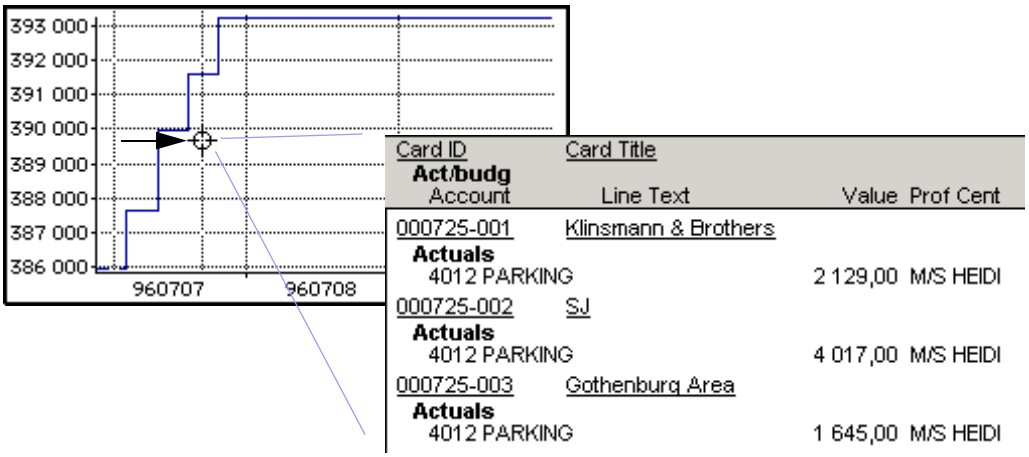
Chart view – Line chart

Point-and-click operation. Basically works in the same way, as for the bar chart (above):



You can only click on a vertical line segment, which represents a transaction value.

Drag operation. In this case you can only drag horizontally (i.e. along the time axis):

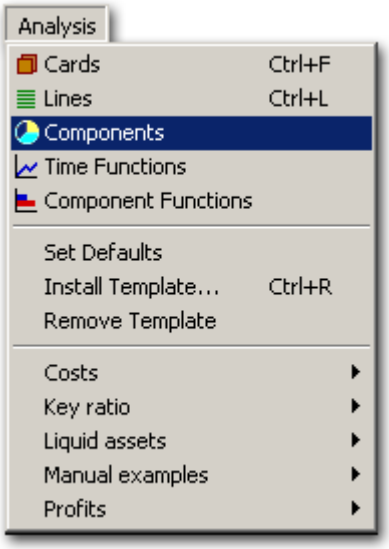


You get the transactions dated during the selected time period.

11

Analysis Templates

Components



Introduction

In the Cards and Lines templates you work on a very detailed level, with individual values. In Components the focus is on aggregated values. Typically you want to see the sums of costs by account, by profit centre, by project, by product, or any other dimension included in your HAT-application. In the example file, Demo Inc, we are limited to two dimensions by the available data – Account and Prof Cent.

The table and chart views

Data in a Components template can be presented as tables or as pie charts (which also hold some tabular data):

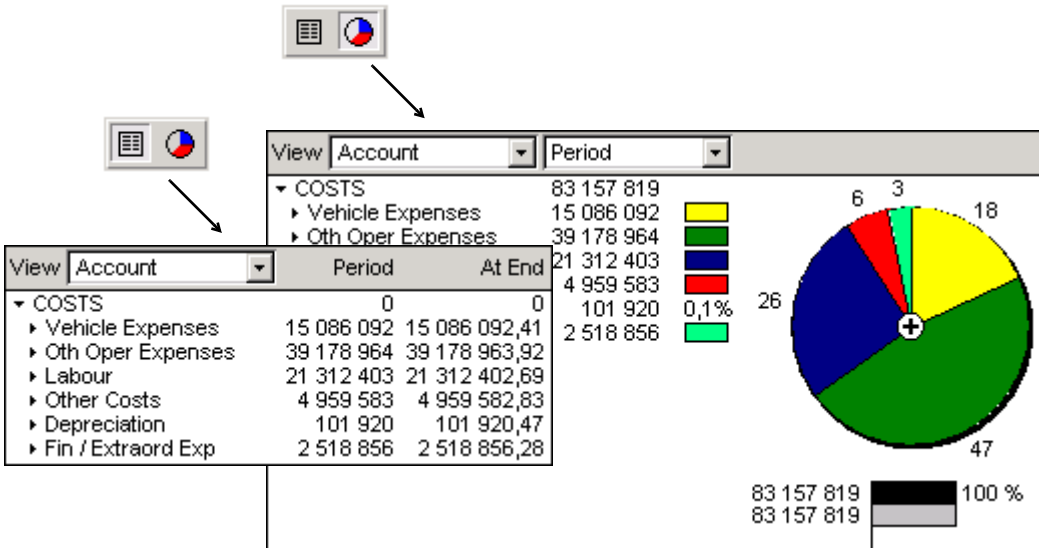


Table view

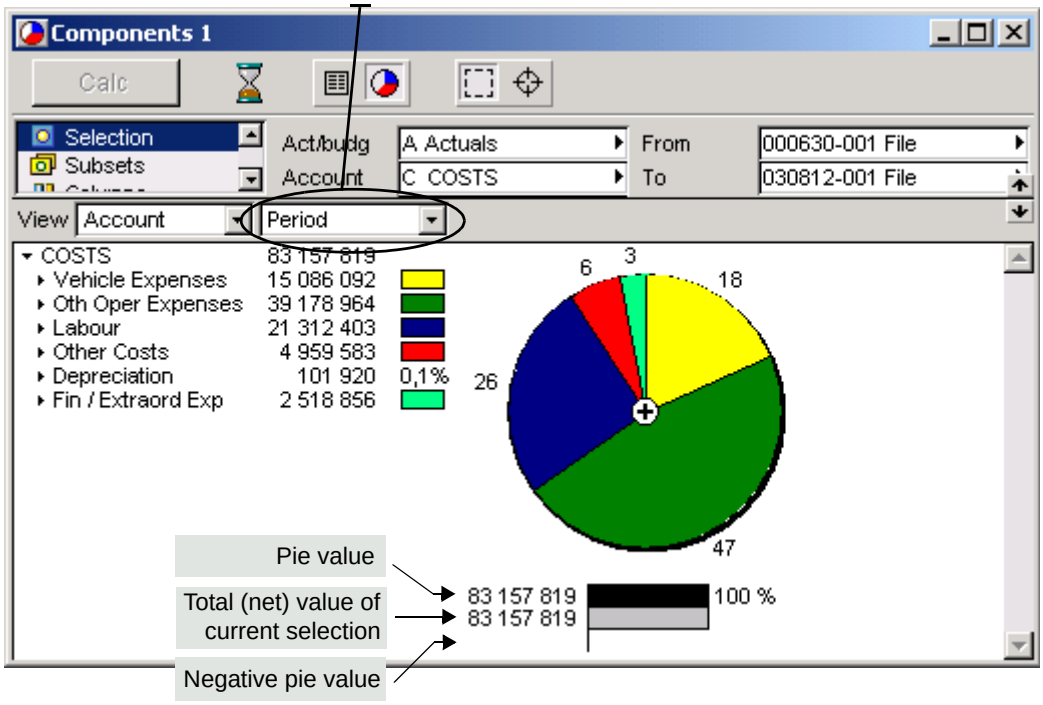
Use this view to see the exact aggregates by component. There are a number of different measures you can display, and you can show all of them, any subset, or just one. This is an example where all available measures are used (each column gives one measure, see “Columns” on page 142):

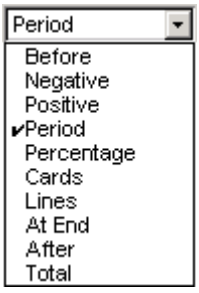
View Account	Before	Negative	Positive	**Period**	Percentage	Cards	Lines	At End	After	Total
COSTS	0			**0'**	0'			0'	0'	0'
Vehicle Expenses	0	-814 334,03	15 900'	**15 086'**	0'	776	1099	15 086'	0'	15 086'
Oth Oper Expenses	0	-9 913 406,36	49 092'	**39 179'**	0'	984	1704	39 179'	0'	39 179'
Labour	0	-16 474 973,80	37 787'	**21 312'**	0'	335	876	21 312'	0'	21 312'
Other Costs	0	-1 003 113,80	5 963'	**4 960'**	0'	712	933	4 960'	0'	4 960'
Depreciation	0		102'	**102'**	0'	8	68	102'	0'	102'
Fin / Extraord Exp	0	-33 965,75	2 553'	**2 519'**	0'	210	268	2 519'	0'	2 519'

Usually only a few of these columns/measures are used in the practical case at hand. The table can be used for analysis by itself, or as a basis for copy-and-paste or export, e.g. to an Excel spread sheet, or any other application where tabular data are useful.

Chart view

In the chart view, you can display one of the columns in table view, together with the corresponding pie chart. You choose which column, in the drop-down menu, situated in the output area heading.





Pie sectors. Each pie sector shows the value of a component as a fraction of the total for the Period. You can change to any other measure, corresponding to the measures on the definition page Columns.

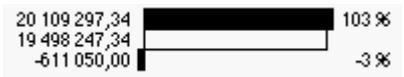
Positive and negative component values in different pies. It is meaningless to show positive and negative values in the same pie. Hence they are shown in separate circles, with areas proportional to their total values.

Related pie sector and component value. By clicking on either a row in the table or a sector in the chart, you can see the correspondence between the two. Move the cursor away from the pie sector before releasing the mouse button if you do not want to expand the sector.

Changing colours. The table legend consists of coloured labels (if you have a black and white display, the colours will be patterns instead). You can change the colour/pattern of a label, by clicking on it.

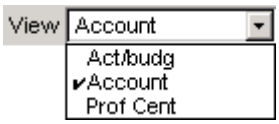
Left and right labels. The labels are arranged in separate columns for positive (to the right) and negative values (to the left). They are also a indented according to their position in the dimension chart hierarchy.

Percentages. Are displayed according to settings on the Options definition page.

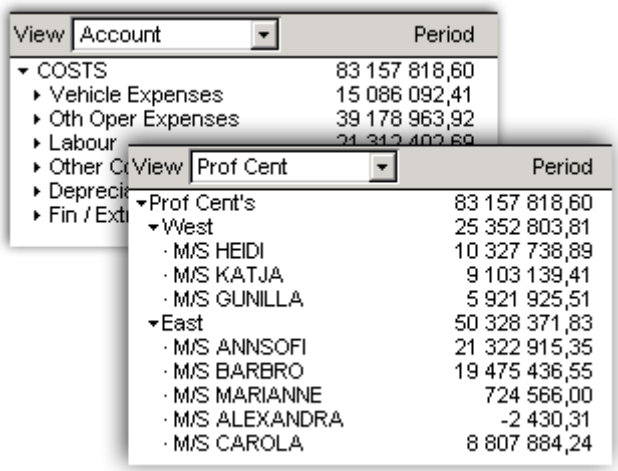


Black and white horizontal bars. The white bar shows the sum of all Line values. The two black bars show the sum of positive and negative values, as currently shown in the pie chart.

View

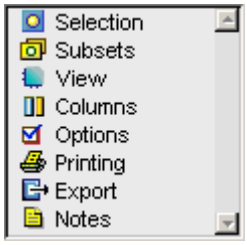


The View menu allows you to instantly change the dimension, along which the selected data are aggregated:



This flexible way to get aggregates by dimension components is a distinctive feature of the Components template (and in the Component Functions template, Chapter 13).

Definition pages



Selection

See section “Selections” on page 103.

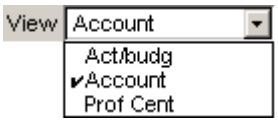
If you have many value fields in the HAT database, you will find a drop-down menu to the right of the From box. Use it to set the value type you would like to show in all the columns and in the pie chart.

Subsets

See section “Subsets” on page 118.

View

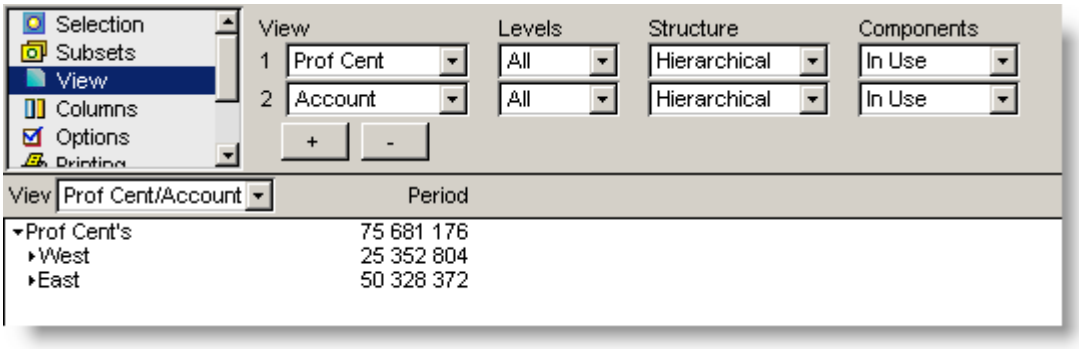
Often you get the desired presentation by choosing one of the existing dimensions from the menu View (as stated above, page 142):



Stacked dimensions

From the page View you will see that there are more advanced alternatives than the simple views:

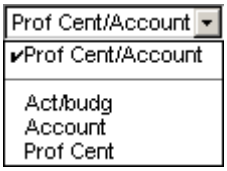
By clicking the plus-button, you will be able to add a dimension in View:



This result is produced by

1. changing the first dimension (1) to Prof Cent
2. keeping the second (2) Account as is (the default setting)
3. clicking the Calc button

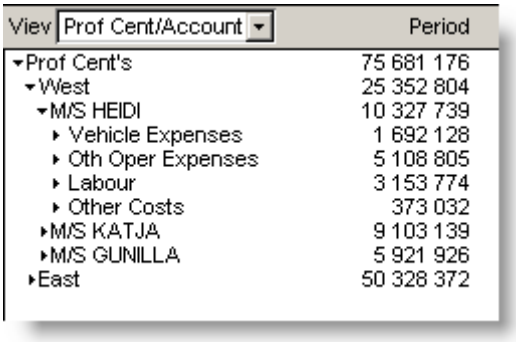
Note that there is now a setting named Prof Cent/Account in the list:



Two dimensions are stacked into one new view. By clicking on its components you can unfold them, as usual:

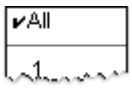
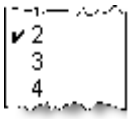
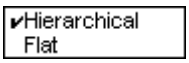
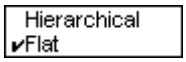
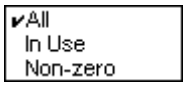
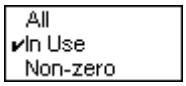
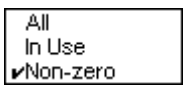
1. first Prof Cent is unfolded until we reach its lowest level
2. then the dimension Account is unfolded.

It may look like this:



After M/S Heidi (the lowest component level in Prof Cent), you will see the main cost categories from Accounts. These, in turn, can be unfolded to the desired level.

Details of presentation.

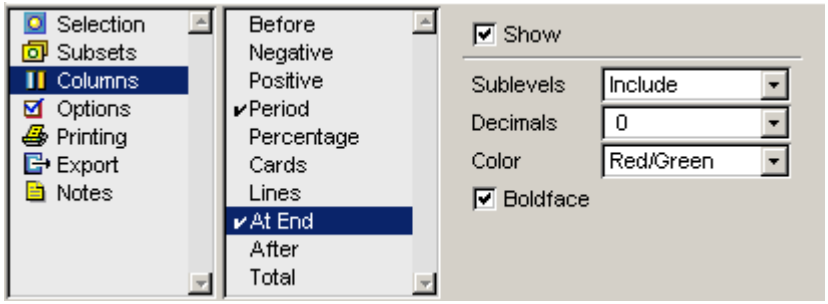
Levels	
	All levels in this dimension are unfolded first, before the components from the next dimension starts to unfold.
	This dimension is not unfolded further down than level 2, then the next dimension starts to unfold.
Structure	
	The components are displayed according to the way they are structured in the dimension chart.
	Only the lowest level components and directly coded components are displayed
Components	
	All components are displayed, regardless if they are used to code any transaction in the database, or not.
	Components which are not used to code any transaction, are excluded
	Only non-zero value component are shown. I.e. all components that are not In Use, and those whose values are zero, are excluded. Note that this will not happen if there are lower level components which have non-zero values, i.e. you can always unfold the hierarchy from a higher level if there is at least one non-zero value further down in the hierarchy.

Example Assume that Account would be the first dimension, and Prof Cent the second in a view with stacked dimensions. The setting Levels = All, probably would give a much too detailed presentation, if the account structure is fairly deep. A limitation to e g Levels = 2 for the Account dimension, may provide a more reasonable and practically useful presentation.

Columns

Determines which data are displayed in table view, and in what format.

Example If you set Columns to,



you will get something like this:

View: Account	Period	At End
Accounts	0	0
ASSETS	153 607 804	153 607 804
LIABILITIES AND EQUITY	-133 611 383	-133 611 383
REVENUE	-103 154 240	-103 154 240
COSTS	83 157 819	83 157 819

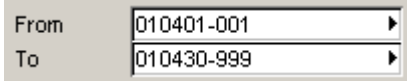
Show. Either click to the left of the column name, or click in the Show box, to display or hide the column.

Sublevels. Both columns in the example are set to Include, i.e. the top hierarchical level does include the sum of all the values at lower levels. The general rules are:

Exclude	Only the values coded directly for each component is displayed.
Include	The component value, displayed at each level, includes the values of all subordinate components.

Decimals, Color and Boldface. See section “Numeric presentation” on page 132.

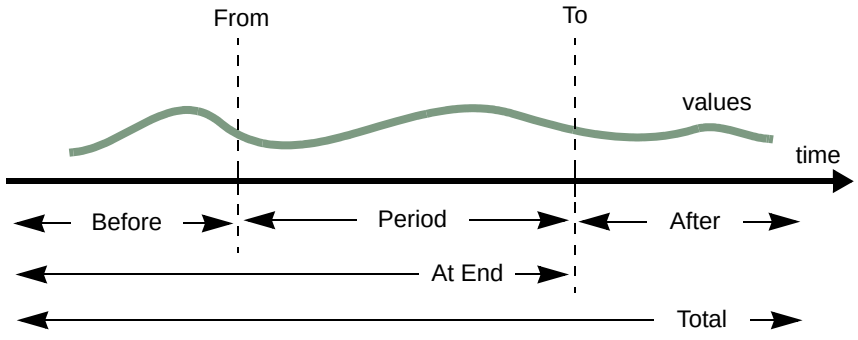
Before, Period, At End, After, and Total. All these column values are related to the time interval defined on the Selection definition page. In the illustration that follows, the time points (i.e. Card IDs) From and To refer to the selected time period:



With all the optional values displayed it may look like this:

Before	Period	At End	After	Total
2 228 916	1 404 414	3 633 330	1 326 253	4 959 583

The basic concept is the Period, and the others relate to it as illustrated below:



E.g. the value At End is the sum of all values, from the very first in the file (which also meets all other criteria in the selection, but for the time restriction), until the Card ID entered in the To-box.

In addition to the measures illustrated above, the following ones are also available:

Negative, Positive. Splits the sum Period in its negative and positive parts.

Percentage. Calculates the distribution of Period values as a percentage of the total Period value, as in this case:

View Account	Period	Percentage
▾ COSTS	83 157 818,60	100,0
▸ Vehicle Expenses	15 086 092,41	18,1
▸ Oth Oper Expenses	39 178 963,92	47,1
▸ Labour	21 312 402,69	25,6
▸ Other Costs	4 959 582,83	6,0
▸ Depreciation	101 920,47	0,1
▸ Fin / Extraord Exp	2 518 856,28	3,0

Cards, Lines. Displays the number of Cards or Lines in the selection.

Card count – the problem of "straddling cards"

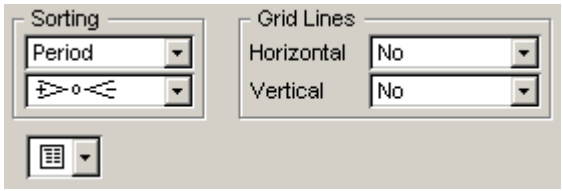
Occasionally the number of cards may look strange when displayed hierarcically over a dimension, as in this case:

View Account	Cards
▾ TRAV + ALLOWANCES	188
· 5522 TRAVELLING 1	130
· 5523 TRAVELLING 1	59

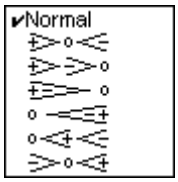
Has HAT suddenly miscalculated the sum of 130 + 59, arriving at 188?
Of course not. The reason is that one card has one line with account 5522 and another with account 5523, in it. The same card is thus counted as 1 in each of the components 5522, 5523, and TRAV+ALLOWANCES.
It is as if a person standing with one foot in Germany and one in France was counted as a citizen of each, but when you add the country figures to get the

number of Europeans, the person is only counted as one. You get the odd effect that 1 + 1 = 1, due to the person straddling the border.

Options



Sorting

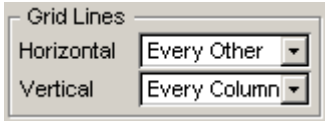


You can choose to sort components either on the basis of the hierarchical structure in the dimension chart (Normal), or based on the component values in a column of your own choice. The sorting orders are:

Sorting order	Explanation	The numbers -4, -2, 0,1,3 will be ordered as
Normal	As in dimension chart	N/A
	By decreasing value	3, 1, 0, -2, -4
	First by decreasing positive value, then increasing negative, zero last	3, 1, -4, -2, 0
	By decreasing absolute value	-4, 3, -2, 1, 0
	By increasing absolute value	0, 1, -2, 3, -4
	Zero first, then by increasing positive, then decreasing negative value	0, 1, 3, -2, -4
	By increasing value	-4, -2, 0, 1, 3

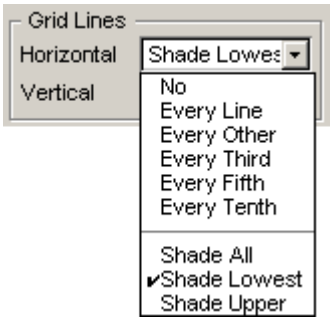
Grid Lines

Increase readability by setting these lines, horizontally and/or vertically:



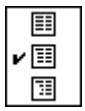
View Account	Before	Period	At End	After	Total
Accounts	0	0	0	42	42
ASSETS	146 087 592	-2 302 283	143 785 310	10 275 110	154 060 420
LIABILITIES AND EQUITY	-148 855 910	2 885 027	-145 970 883	12 359 500	-133 611 383
REVENUE	-16 888 364	-12 232 319	-29 120 682	-74 033 557	-103 154 240
COSTS	20 109 297	11 649 574	31 758 872	51 398 947	83 157 819

You also have the option to display lines at the lowest, upper, or all levels:



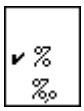
These setting gives an output that typically looks like this:

▾ Labour	0
▾ SALARIES	0
· 5010 WAGES LINE 16	9 434 505,00
· 5011 NON-RECURRENT AMOUN	2 229 692,00
· 5007 PROV FOR WAGES1	78 369,00
· 5008 WAGES 1 TRANSFERRED	0
· 5009 PROV FOR WAGES 2	-12 722,00
▸ PROV FOR EMPLOYER CONTR	5 248 887,00
▾ TRAV + ALLOWANCES	0
· 5520 ALLOWANCES 1	1 259 334,00
· 5522 TRAVELLING 1	321 996,16
· 5523 TRAVELLING 1	150 202,47
▸ OTH PERS COSTS	91 913,55
· 5810 TRAINING	600,00
▸ OTH WORK FORCE EXP	-385 475,00



Presentation of the dimension charts

Controls how the dimension hierarchy is presented. You set this as a general property of each dimension chart. You can overrule this setting here, if needed.



Display of percentages (chart view, only)

Affects how percentages are displayed in chart view.
The alternatives are: None, percentages without decimals, and with one decimal place.

Show Scale (chart view, only)

Allows you to control if the horizontal scales will be displayed or not (see “Black and white horizontal bars” on page 141):

Printing, Export, and Notes

See section “Printing” on page 120, “Export” on page 121, and “Notes” on page 121.

Working interactively in the output area

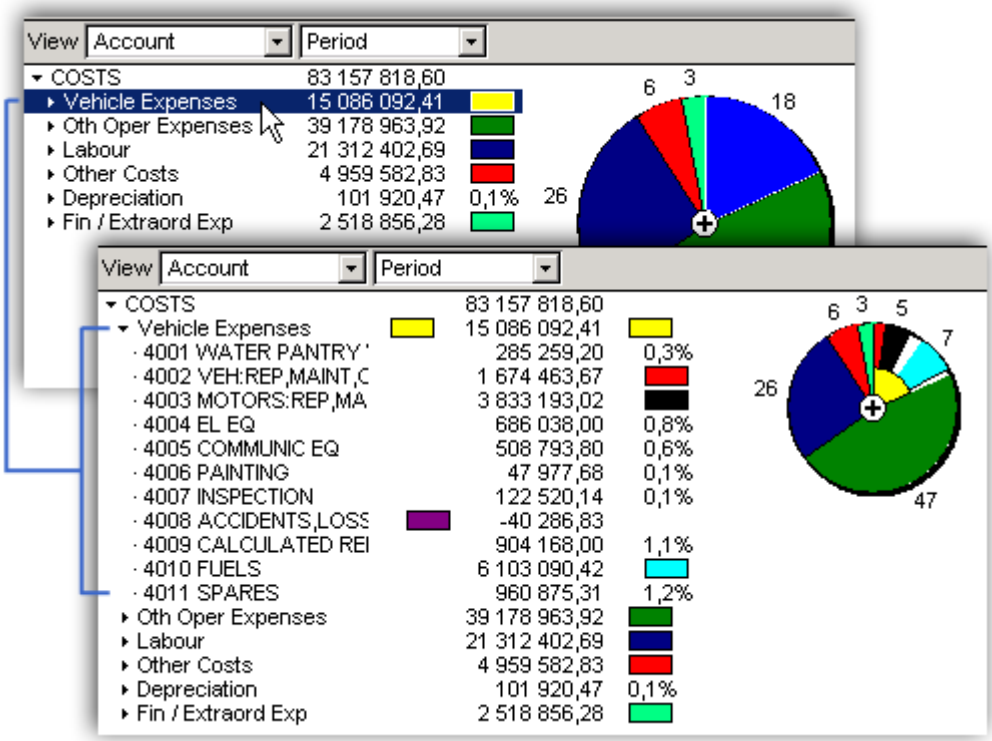
You basically have two different ways to explore more details in the output area of a Components template:

- Unfolding high level components to give a more detailed view, within the same template, using regular point-and-click operations.
- Showing the underlying details of a number or graphical element, with a transfer to a Lines template. In this case doing a drill-down using the drill down tool.

Unfolding components

You can expand a component to its sub components in two ways:

- Click on the components hierarchy symbol or directly on the component text, e.g. CL Labour in the same way as you expand a component in a table.
- Click on the pie sector for the component.

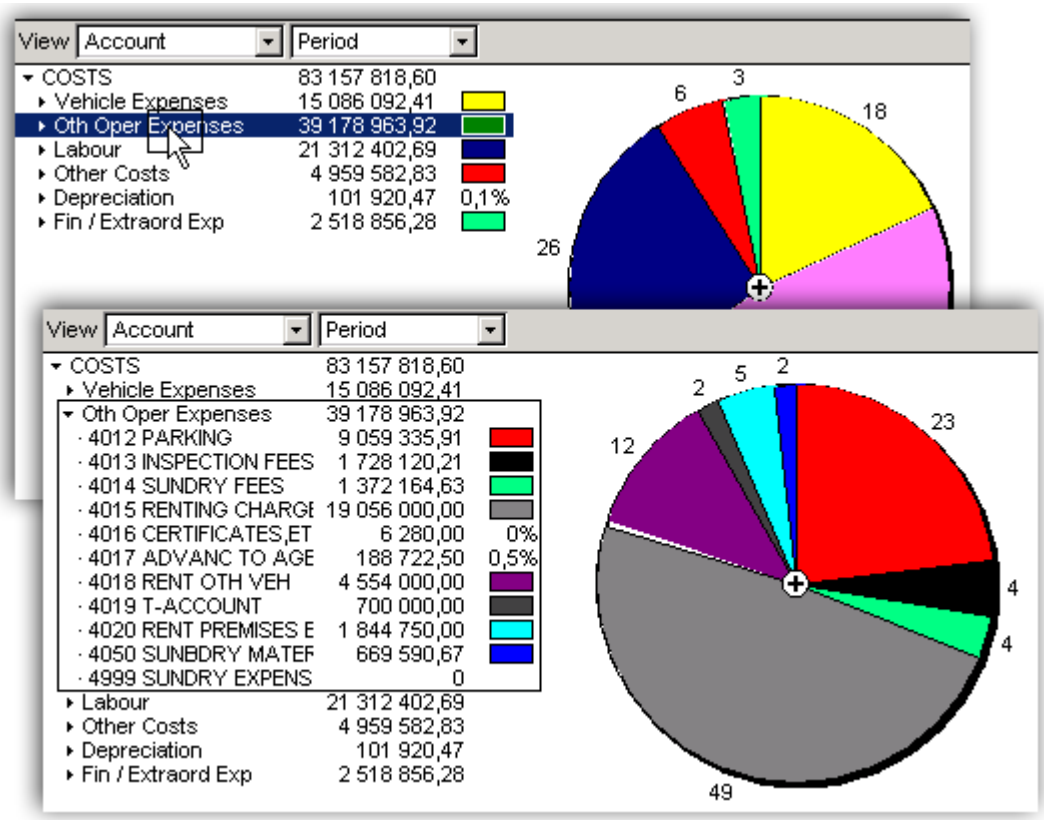


Collapse component. There are two ways to collapse an expanded component:

- Click on the components hierarchy symbol or the component text.
- Click on the inner pie sector for the expanded component.

Pie for sub component. If you expand all pie sectors in this example, you get overwhelmed by all its pieces. The remedy is to focus on a specific sub com-

ponent. If you hold down the Shift key while clicking on a component, e.g. Oth Oper Expenses, the chart changes to:



The chart now corresponds to the values inside the frame. The black and white horizontal bar chart shows the relative size of this pie, compared to the original one.

To reverse this operation, Shift-click on the same component (Oth Oper Expenses) again.

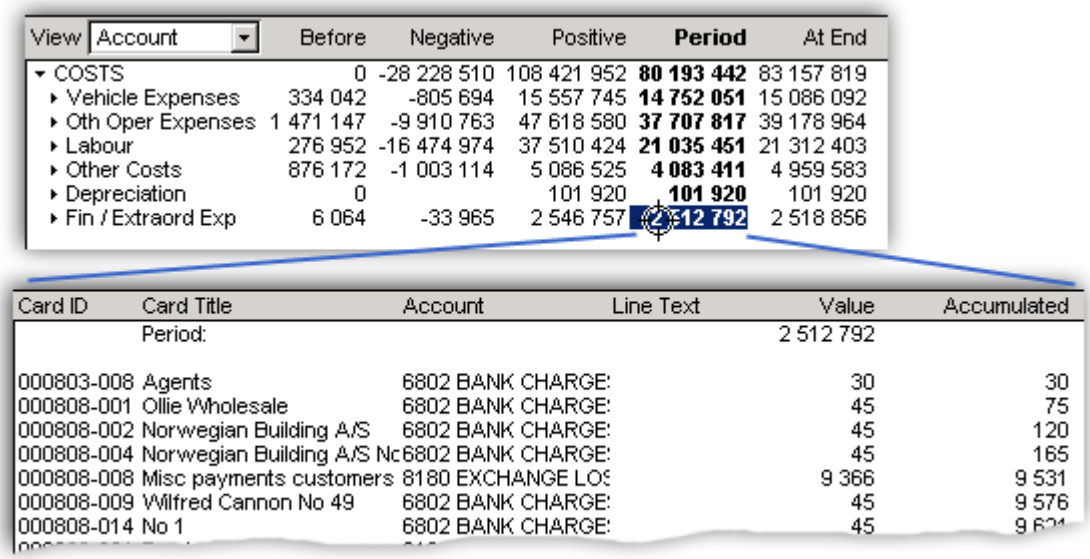
If you click (without holding down the Shift key) on a higher level component. the boxed area moves to that level. You will then have to expand this component to see its sub components.

Using the drill down tool

The point-and-click method to successively unfold more details is often all you need. But if you want to see the individual transactions, you use another operation. Change cursor by choosing the drill down tool or use the short cut to press the Ctrl-key. When you click with the drill down symbol on a number or a pie-segment in the output area, you will get a new Lines template, which will show the details.

Table view

If you Ctrl-click on any number in the output area, the corresponding Lines will be displayed in table view. The header line Period will always be shown:

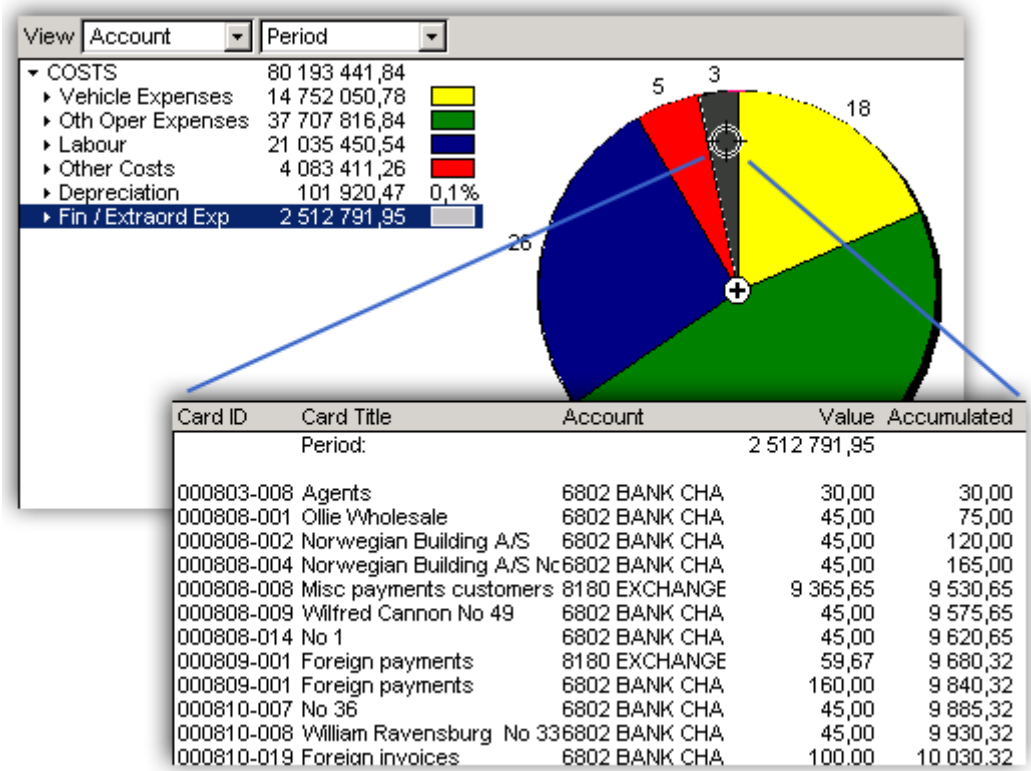


View: Account	Before	Negative	Positive	**Period**	At End
COSTS	0	-28 228 510	108 421 952	**80 193 442**	83 157 819
Vehicle Expenses	334 042	-805 694	15 557 745	**14 752 051**	15 086 092
Oth Oper Expenses	1 471 147	-9 910 763	47 618 580	**37 707 817**	39 178 964
Labour	276 952	-16 474 974	37 510 424	**21 035 451**	21 312 403
Other Costs	876 172	-1 003 114	5 086 525	**4 083 411**	4 959 583
Depreciation	0		101 920	**101 920**	101 920
Fin / Extraord Exp	6 064	-33 965	2 546 757	**2 512 792**	2 518 856

Card ID	Card Title	Account	Line Text	Value	Accumulated
	Period:			2 512 792	
000803-008	Agents	6802 BANK CHARGE		30	30
000808-001	Ollie Wholesale	6802 BANK CHARGE		45	75
000808-002	Norwegian Building A/S	6802 BANK CHARGE		45	120
000808-004	Norwegian Building A/S Nc	6802 BANK CHARGE		45	165
000808-008	Misc payments customers	8180 EXCHANGE LOS		9 366	9 531
000808-009	Wilfred Cannon No 49	6802 BANK CHARGE		45	9 576
000808-014	No 1	6802 BANK CHARGE		45	9 621

Chart view

Clicking on any element (number or pie sector) in chart view of a Components template, will produce exactly the same type of result. As in this example:



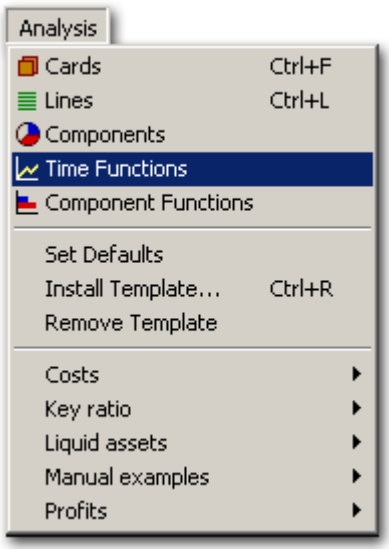
Card ID	Card Title	Account	Value	Accumulated
	Period:		2 512 791,95	
000803-008	Agents	6802 BANK CHA	30,00	30,00
000808-001	Ollie Wholesale	6802 BANK CHA	45,00	75,00
000808-002	Norwegian Building A/S	6802 BANK CHA	45,00	120,00
000808-004	Norwegian Building A/S Nc	6802 BANK CHA	45,00	165,00
000808-008	Misc payments customers	8180 EXCHANGE	9 365,65	9 530,65
000808-009	Wilfred Cannon No 49	6802 BANK CHA	45,00	9 575,65
000808-014	No 1	6802 BANK CHA	45,00	9 620,65
000809-001	Foreign payments	8180 EXCHANGE	59,67	9 680,32
000809-001	Foreign payments	6802 BANK CHA	160,00	9 840,32
000810-007	No 36	6802 BANK CHA	45,00	9 885,32
000810-008	William Ravensburg No 33	6802 BANK CHA	45,00	9 930,32
000810-019	Foreign invoices	6802 BANK CHA	100,00	10 030,32

The target pie sector represents the period value 22 101, which is ”explained” in terms of the Line values that add up to this value (you find it the header line Period).

12

Analysis Templates

Time Functions



Introduction

In Time Functions you typically select many subsets of data. For each subset you define a variable that holds a scalar measure of the selected values. Usually you will find that the sum of all the selected values is the most useful measure. But in some cases you choose another measure from the list of available alternatives (e.g. number of transactions, the average value, etc).

Based on the selection variables, you can build formulas of your own choice. E.g deviations of actual values from budget values, ratios between profit and sales, etc.

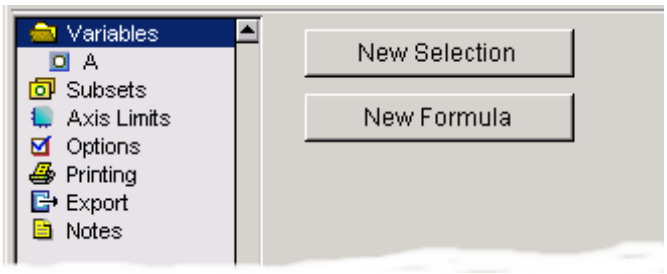
The results are presented as functions of time. In a table of numbers (table view) or graphically (chart view).

At any instant you can change the basic time unit, which defines the *time resolution*. There is a long list of such resolutions, which are predefined in HAT. The available alternatives span from yearly measures, down to single Cards or Line items. You can also use your own, customised, time scales

Definition pages

Variables

The Variables page represents the overall level for creating Selection Variables and Formula Variables:



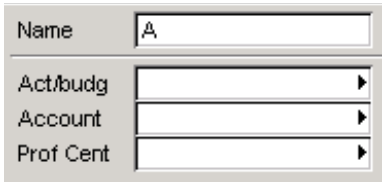
If you have not made any special changes to the default template (with Set Defaults), the first Selection page will be an empty page named A. With these buttons you can create:

- a *New Selection*, i.e. another selection variable which allows you to specify a measure based on the usual selection boxes.
- a *New Formula*, where you can define a formula with selection variables, and perhaps with other formula variables, as elements.

Defining selection variables

The selected Lines

You enter selections in the same way as in all other templates, e.g Actual Costs:



The names

Variable name. 'A' is the default name, which you can change to any other name in the right box. In addition to letters and numbers, the dot, space and number sign (#) characters are allowed in a name. All other characters will be changed to a dot.

Example

If you enter the string

'Actual&Costs'

HAT will change this to

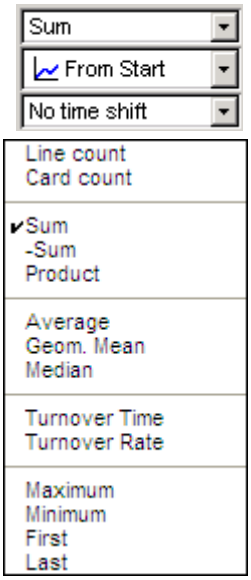
'Actual.Costs' (with a dot instead of the ampersand)

Title. The Title box

will not show up unless the Show box is ticked. Enter any text string to be a title in the column for this variable. If you leave it empty, the name of the variable will be used instead. You often do not want too long names of variables. The Title

The measure

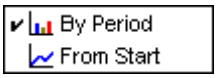
The first two drop-down menus to the right of the From and To boxes, define what measure to use.



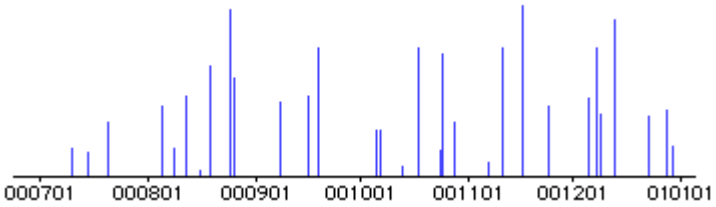
First drop-down menu. Choose any of

Line count	Number of Lines
Card count	Number of Cards
Sum	Sum of values in the selection
-Sum	Negative sum
Product	Product of values in the selection
Average	Arithmetic medium
Geom. Mean	Geometric medium
Median	Median value in selection
Turnover Time	Average age (days)
Turnover Rate	Turnover (times per year)
Maximum	Largest value
Minimum	Smallest value
First	First value
Last	Last value

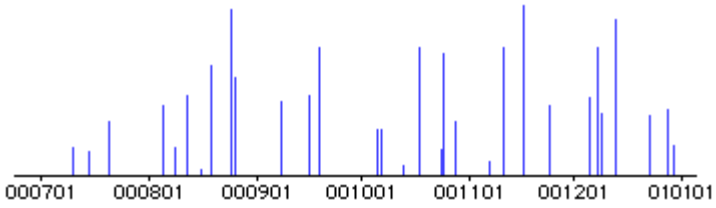
Sum is certainly the one you will use most frequently, but occasionally any of the others is useful. Use the -Sum to "reverse the axis" of negative values.

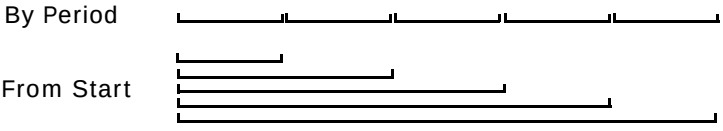


By Period or From Start. The transactions in the selection could be spread along the time axis something like this:



If the basic time unit has been set to e.g. Month, and the type of measure to Sum, you can choose to sum these transaction values By Period (i.e. by month) or From Start. They are both illustrated in this chart:



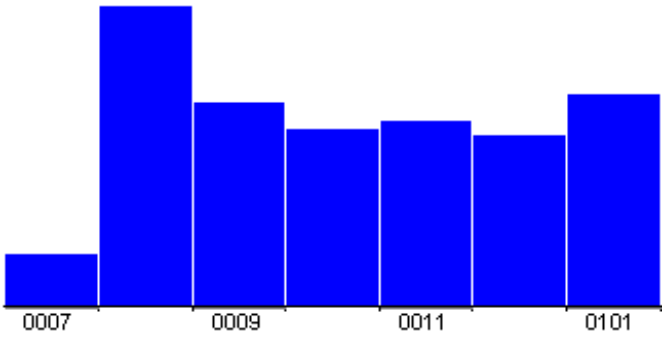


showing which intervals are used for calculating the measure. If the measure is based on Sum,

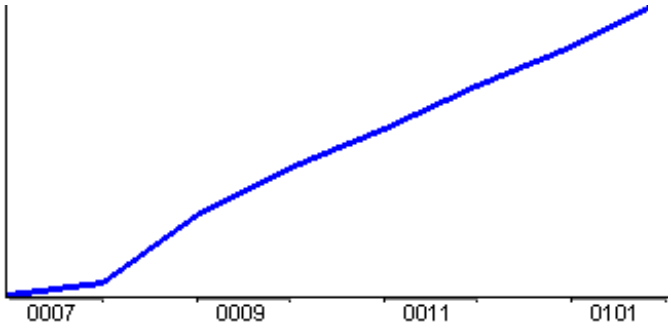
- each By Period value will be the sum of values during the month

- each From Start value will be the sum of values from the very first value, until the end of each month. In other words – the running total, or accumulated value over time.

In chart view a selection variable set to By Period, is always displayed as a bar chart:

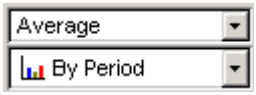


But if it is set to From Start, it is always a line chart:



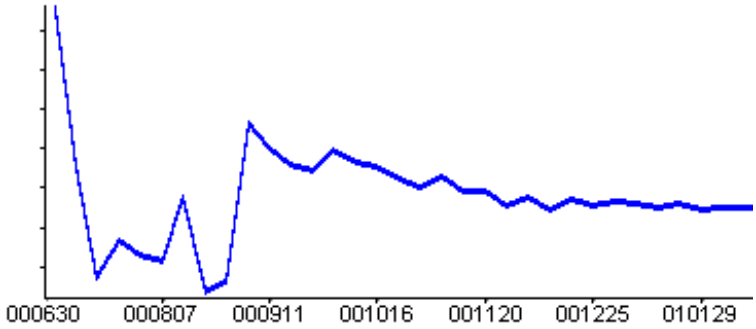
In the bar chart, the area of a bar corresponds to the total transaction value during the month. The accumulated values in the line chart are exactly correct at the end of each month. The slope of the straight line segment between two such values may be conceived as showing the average rate of change between these values.

The same logic applies to the other measures. E.g. if the drop-down menus are set to,



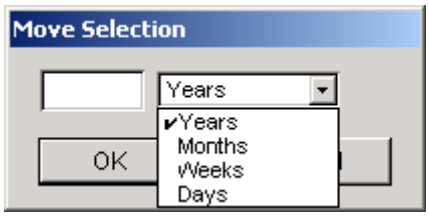
you will get the average value of all transactions during each period. What happens if you set the second pop-up to From Start?
The average value displayed at the end of each period will be based on all transactions from the very first in the selection, until the end of the period. The average will thus be based on a successively larger number of transactions. So, for a

certain selection, you often tend to get a curve that approaches the average transaction size, with successively smaller fluctuations:



The important thing to note is, that although you may tend to think of the From Start setting as representing ”accumulation” in the sense of successively adding period values, this is only true for the (very frequent) case where the first setting is Sum. In other cases you should consider how From Start is defined, to get a correct understanding of the displayed chart.

Time shift. The time scale along which all transactions and measures are presented is always fixed. But you may want to compare e.g. monthly figures from the year 2000 with the corresponding values for 2001. By shifting the values for one of the years, a full year backward or forward, you can superimpose one on the other, which allow you to define a formula e.g. calculating the difference between the monthly figures. The default value is No time shift. In addition to the standard time shifts (one Year, Quarter, or Month) you can define a time shift of you own choice, with the entry *Other* ...



where you enter a positive or negative integer to indicate how many days, weeks etc you would like to move the transactions, along the time axis. A positive integer moves the transactions forward, and vice versa.

Multiple value fields

In addition to the other settings, a drop-down menu will show up immediately to the right of the From-box, if more than one value field is present in the database. Use it to set which value field to use for the current selection variable.

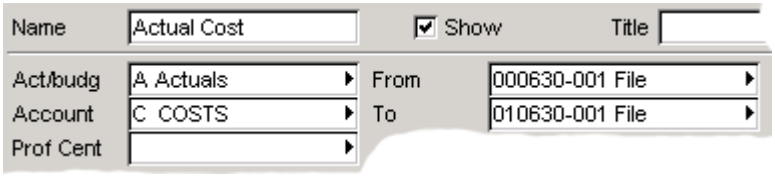
Defining Formulas

Based on selection variables, you often want to calculate other values, such as the deviation between actual figures and budget, return on investment (ROI), return on sales (ROS), liquidity ratios, and a multitude of other useful measures.

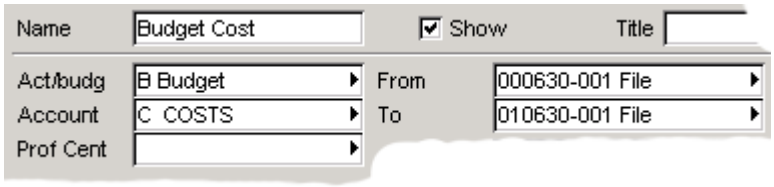
Basics

We illustrate this with a simple example – calculating the deviation of actual outcome compared to budget values. Two selection variables have been defined:

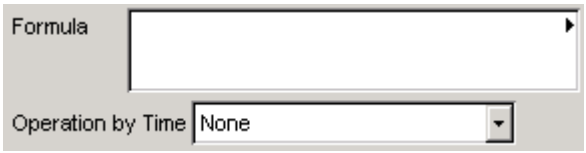
1. Actual costs by month, until the end of February 2001



2. Budgeted costs per month, for the same time period



By clicking the New Formula-button once you will get

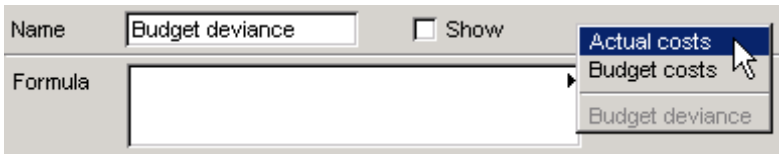


The common way to express the budget deviance is to calculate the difference

Budget deviance = Budget costs - Actual costs

but you sometimes want it expressed as a percentage (see below).

Enter the elements in the formula box, either by entering the full arithmetic expression from the keyboard, or by using the pop-up arrow in the upper right corner of the formula box. If you left-click on it, the variables will be displayed.:



Right-click (or AltGr+left-click) will display the list of operators.

MacOS

The operations are the same, but for the AltGr button, which corresponds to the Option button on a Macintosh keyboard.

If we have chosen to display all values (from the selections and the formula), the result may look like this:

Months	Actual Cost	Budget Cost	**Budget deviation**
Before 000630	0	0	**0**
0006	0	0	**0**
0007	2 964 377	9 373 519	**-6 409 142**
0008	17 144 921	8 511 634	**8 633 287**
0009	11 649 574	8 409 970	**3 239 605**
0010	10 080 128	10 368 224	**-288 096**
0011	10 613 109	2 667 939	**7 945 170**
0012	9 780 033	14 901 137	**-5 121 104**
0101	12 040 629	10 349 437	**1 691 192**
0102	8 811 845	9 043 601	**-231 756**

We have also chosen to display negative values (values worse than budget) in red, and positive values (better than budget) in black.

If we want the budget deviation expressed as a percentage, the following formula is one reasonable way to define it:

```
Budget (%) = Budget deviation/Budget costs*100
```

This is our second formula, and the table will have another column:

Months	Actual Cost	Budget Cost	Budget deviation	**Deviation (%)**
Before 000630	0	0	0	
0006	0	0	0	
0007	2 964 377	9 373 519	-6 409 142	**-68**
0008	17 144 921	8 511 634	8 633 287	**101**
0009	11 649 574	8 409 970	3 239 605	**39**
0010	10 080 128	10 368 224	-288 096	**-3**
0011	10 613 109	2 667 939	7 945 170	**298**
0012	9 780 033	14 901 137	-5 121 104	**-34**
0101	12 040 629	10 349 437	1 691 192	**16**
0102	8 811 845	9 043 601	-231 756	**-3**

In this column positive values are displayed in green and negative in red.

Available operators

Operators in formulas. The elementary operators (+, -, *, and /) are usually all you need, but there are a lot of other operators that are useful in some cases:

	Operator symbol	Description	MacOS symbols
Time	T	Time, in years (i.e. T=0 at From date, T=0.5 at middle of first year, T=1 at end of first year, T=2 at end of second year, etc.)	
	#	Number of lines	
Arithmetic	+ -	Addition and subtraction	
	* /	Multiplication and division	
	^	Power	
	sqr	Square	
	sqrt	Square root	√
Exponential	exp	Natural (base e) exponential function	
	exp2	Base 2 exponential function	

	Operator symbol	Description	MacOS symbols
	exp10	Base 10 exponential function	
Logarithmic	ln	Natural (base e) logarithmic function	
	lg	Base 2 logarithmic function	
	log	Base 10 logarithmic function	
Trigonometric	sin	Sine (argument in radians)	
	cos	Cosine (argument in radians)	
	tan	Tangent (argument in radians)	
Rounding	round	Nearest integer	≈
	up	Upwards (to nearest integer)	»
	down	Downwards (to nearest integer)	«
	int	Integer part (i.e. round ”towards zero”)	
	frac	Decimal part (i.e. keep decimal fraction only)	
Special	abs	Absolute value	
	sign	-1 if argument negative, +1 if positive, 0 if zero	
	max	Largest value	
	min	Smallest value	
	if	Conditional value (if-statement, see description below)	
	ran	Random number in interval [0-1]	
	pi	Pi (3.141592…)	π

MacOS

The column ’MacOS symbols’ includes *alternative* Macintosh symbols. Note that they work in Macintosh only, you cannot use them in a Windows environment.

A majority of these are self-explanatory. They are used in formulas, and are typically written as in the the following examples, where Aand B denote selection variables:

- spaces are insignificant and HAT tries to make sense of the expressions entered by users, e. g.

  A+B, or

  A +B, or

  + (A+ B)

  are all perceived as A+B by HAT
- if the written expression is illogical or imprecise, HAT clearly declares how the expression is interpreted, e.g. if you enter the formula

  (A+)B

  which lacks an operator before the B, it is shown as

(A+)

which is unambigous (although it looks a little odd!)

- some operators operate on many values. In these cases the individual values are separated by a semicolon (;), e. g. when the formula contains a max-expression, like this

  `100 + max 56; A; B`

  100 is added to the largest of the values 56, A, and B

- whenever in doubt, use parentheses to clarify the order of operations.

  The formula above could as well be written

  `100 + max (56; A; B)`

- a few additional comments on the operator if:
  - its syntax is as follows

    if <comparative expression> ; <value if true> ; <value if false>

    where *value* is allowed to be any valid expression resulting in a single value, and the *comparative expression* has either of the formats

    A>B, A<B, A>=B, or A<=B
  - two examples of valid if-statements:

    `if A>B ; 1; 0` (if A is larger than B the value is 1, otherwise 0)

    `if (A-B > 0; A*2; B)` (if A-B is larger than 0, the value is double A, otherwise it is equal to B)

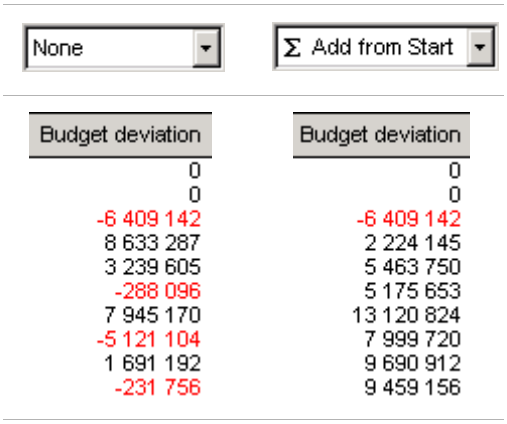
- the comparative expression is evaluated to 0 (false) or 1 (true), which means that these expressions sometimes can be used in formulas in a more direct way (than using the if-operator). E.g. the formula

  `(A>B)*30`

  will produce the result 30 if A>B, otherwise 0. The corresponding if-statement would be

`if A>B; 30;0`

Operation by Time. The drop-down menu below the formula box, allows you to define operations on consecutive period values. You may want to see how the budget deviance accumulates over time, for example. To get these values calculated and displayed, set this drop-down to Add from Start. The values will be:



The full list of operations is as follows:

Setting	Meaning
None	No operation
Σ Add from Start	Accumulate period values
Δ Difference	The difference between consecutive values. If applied to a selection variable, defined as Sum: From Start, the result will be same as Sum: By Period.
Π Multiply from Start	Multiplies consecutive values. Useful e.g. with index series, where multiplication is the basic operation
÷ Quotient	The quotient between successive values, i.e. the inverse of multiplication

Switching between variables

When you work with a template using many variables, you often want to switch quickly from one variable to the other. Instead of changing it via the menu, you can simply click on its column header (provided it is displayed, of course).

Subsets

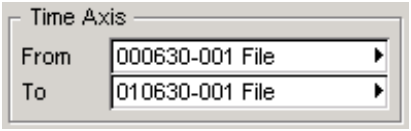
See section “Subsets” on page 83.

Axis Limits

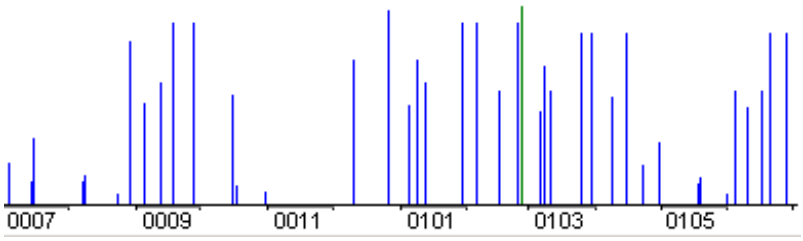
The variables in a Time Functions template, may be defined for different time spans – depending on what is entered in the From and To time boxes for each variable. On the definition page Axis Limits you set the time span covered by the template, as a whole.

Time Axis. The settings in the From and To boxes not only determine how the tables or diagrams are displayed. They also indirectly define the Before value, which will be explained further.

Assume that the Time Axis is set to

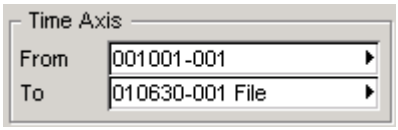


for a certain selection, and that the transactions time series looks like this:

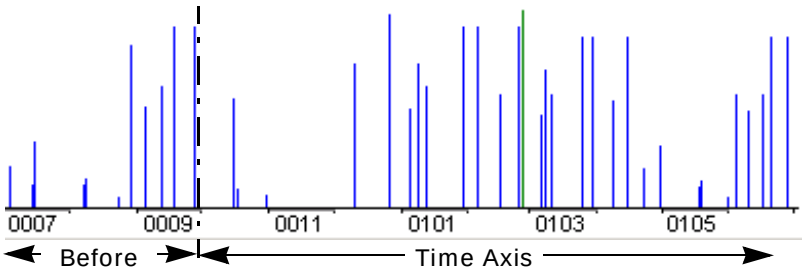


If the From date is changed to 001001, the series in all presentations (tables or charts) will begin at this date, but it will still be possible to refer to transactions before 001001. This is important in the common case where you want a selection variable to show the accumulated values, starting from an entry level defined by transactions preceding its starting point.

If the Time Axis boxes in this example were set to

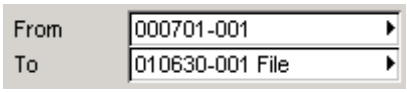


it would implicitly define the following basic time scale:

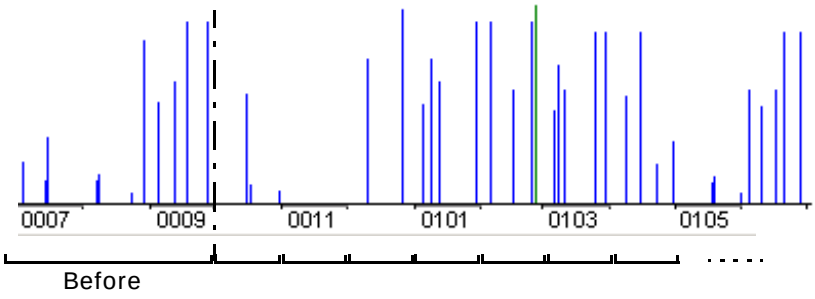


Although any selection variable defined within this context, primarily is defined within the Time Axis time span, it can also ”reach” into the Before time span.

E.g. if the selection variable would be defined as Sum By Period for the time interval



with the time scale is set to Months, the value intervals would be:

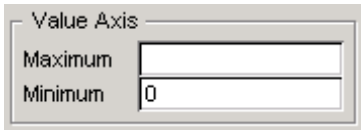


The illustrated intervals have names corresponding to how they are named in the Time Functions table:

Months	Period values
Before 001001	1 004
0010	104
0011	0
0012	384
0101	406
0102	354
0103	511
0104	325
0105	42
0106	611

Value Axis. Sets the vertical limits, in chart view.

Example You may want to always show the zero base line. Then use the setting:



If nothing is entered in these boxes, HAT will automatically adjust the scale, to encompass all values, without wasting any ”screen estate”.

Short cut to the Axis Limits definition page. If a Time Functions template is displayed in chart view, you can click anywhere along the axis, in the outer border, to get the Axis Limits definition page displayed.

Options

Available settings depend on whether table view or diagram view is chosen.

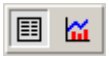
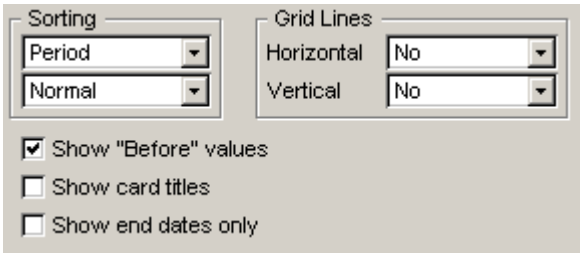


Table view

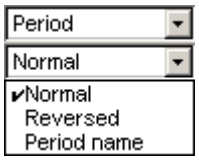
The page looks like this:



Sorting. The data may be displayed along a time axis, or according to the values of one of the variables. Only the displayed columns and their values are eligible to influence the order. To the left, you will find an example of how it may look:

1. If Period is chosen, the table values will be sorted along the time axis, using the chosen time scale.
2. If any of the other alternatives are chosen, the table will be sorted according to the corresponding numerical values. In the picture to the left, you will find that the variables Budget and Actual+budget are displayed. I den vänstra

bilden framgår att variablerna Ufall+prognos samt Budget visas i tabellen. The variable Actual costs is dimmed, which shows that the corresponding column not is displayed. It is therefore not eligible as a sorting criterium.



If you have chosen Period, you have the following settings to choose from:

1. Normal, according to the regular calendar
2. Reversed, will reverse the sorting order
3. Period name, means that the periods are sorted alphabetically, based on their period names.

Grid Lines. See section “Grid lines” on page 115

Show “Before” values. Makes it possible to include Before values, or not. See section “Sum Before” on page 128.

Show card titles. If the resolution Active Cards is chosen, you can also show the card titles for all selected cards.

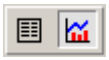
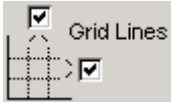


Diagram view

On this definition page a lot of different settings are gathered. They are grouped in two sections – Graphic Presentation and Grid Lines.

Graphic Presentation. This section concerns the chart view only

Setting	Meaning
	Displays the values in exponential format
	Changes the direction of the graphically displayed values, in the vertical direction. Note that the values themselves are not changed.
	Displays grid lines in the diagram, vertically and/or horizontally
	Determines what time scale to use. The built in time scale is called Dates. It is the only one available, if no custom Time Scale has been defined, in the Database Menu.

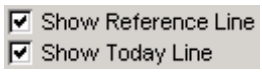
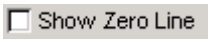
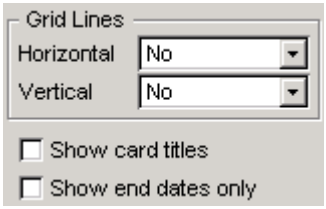
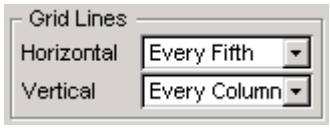
Setting	Meaning
	Displays vertical lines: A red line representing the Reference Point (see Database Settings… page 92). A green line showing current date, according to the system clock
	The horizontal zero line is shown as a dotted line.
	Controls how the bars are displayed: side-by-side, overlapped, etc.

Table view. These settings are only relevant for table view.



Grid Lines. Horizontally there are a lot of different options. Vertically you can choose between having a dotted line between every column, or none at all.



Show card titles. It is possible to choose to show Card titles if the resolution is Active Cards or higher:

Show end dates only. Controls how time values are displayed.

If the time resolution is set to Months, an individual month can be displayed either in the format YYMM (“from the beginning to the end of this month”) or represented with the last day of the month, YYMMDD (“the month that ends at this date”).

Printing, Export, and Notes

See section “Printing” on page 120, “Export” on page 121, and “Notes” on page 121.

Other settings

Chart and Table views

Use these buttons to change between the chart and table views.

Time Scales

In the left most part of the output header, you control the time scale resolution, used to display the results. All entries above the dotted line are standard resolutions, always available in HAT. Below the dotted line you will find the custom time scales which have been installed via Time Scales in the Database menu. Most of the standard resolutions are self-explanatory. But those with the word Active in them, may need further explanation.
All the selection variables defined for a certain template, collectively define the set of Lines that are included in any of these variables. A Line in this set is called *active*, if it has a non-zero value. If a Group contains a Line which is active, also this Group will be referred to as *active*. And so on, up to the Day level.

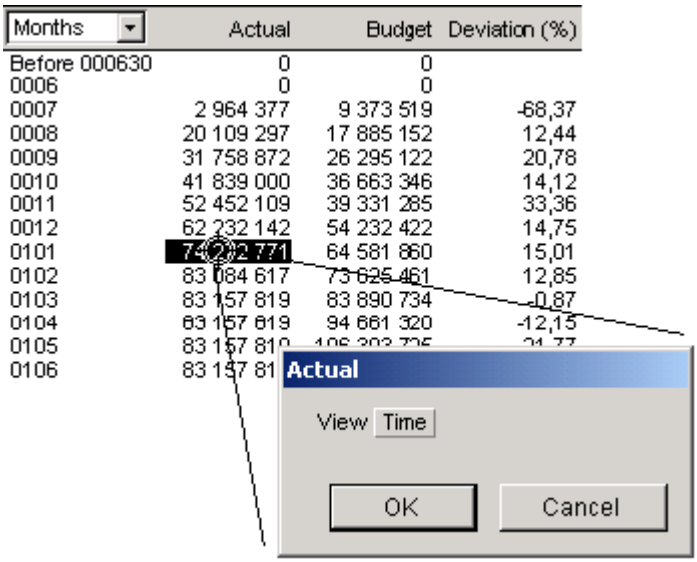
The menu is set to Active Cards, and the measure of the selection variable A is set to Sum: By Period. You will then get the sum of all Line values in each Card. The time scale will be rather detailed, too – including the ordinal numbers (-001, -048, etc).:

Active Cards	Period values
Before 001001	1 004
001014-001	82
001016-048	14
001029-001	9
001209-001	108
010104-035	73
010107-001	108
010111-062	90
010128-001	135
010204-001	135
010214-017	84

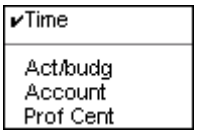
Working interactively in the output area

As usual with HAT, the general idea is to show the underlying details, by simple point-and-click operations. You can click on tabular or graphical elements. The result will always be presented in table view. Whether the element you click on represents a ”pure” selection, or is the result of a formula, makes a distinct difference.

Clicking on a selection variable element



In the dialogue window you specify the dimension, along which you want the number to be displayed in more details. The intrinsic time dimension is the default choice, but you can also choose one of the custom defined dimensions, instead:



The specification of the element will depend on the choice in the drop-down menu:

If the choice is Time. The full list of lines specifying the element, in terms of the underlying numbers, will be shown in a Lines template:

Card ID	Card Title	Account	Line Text	Value	Accumulated
	Period:			74 272 771	
000701-002	Leonardo Nilsone Inc	7310 VEH INSUR		8 776	8 776
000701-002	Leonardo Nilsone Inc	7310 VEH INSUR		15 079	23 855
000701-002	Leonardo Nilsone Inc	7310 VEH INSUR		4 392	28 247
000701-002	Leonardo Nilsone Inc	7310 VEH INSUR		14 063	42 310
010131-054	ASG Transport	4012 PARKING		1 859	74 267 983
010131-055	ASG Transport	4012 PARKING		1 859	74 269 842
010131-056	Gotham Transport	4012 PARKING		1 756	74 271 598
010131-057	Office Systems	6501 OFFICE EQ LES		200	74 271 798
010131-057	Office Systems	6501 OFFICE EQ LES		973	74 272 771

One of the custom dimensions. The corresponding Components template will be displayed, e.g. if the dimension is set to Account:

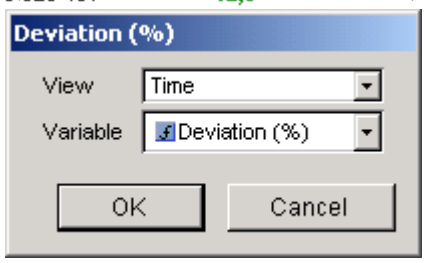
View: Account	Period
COSTS	74 272 771
Vehicle Expenses	13 920 867
Oth Oper Expenses	34 565 622
Labour	18 403 086
Other Costs	4 780 220
Depreciation	89 479
Fin / Extraord Exp	2 513 498

You will see the number specified by account, unfolded one level. By pointing and clicking you can reveal further details, as usual in a Components template.

Clicking on a formula element

You will be asked not only to decide what dimension to show, but also if you would like to see the formula value itself exposed in more detail, or rather see one of the underlying selection variables. Often you can just as well click on the selection variable itself to achieve this, if it is displayed.
The following type of dialogue will show up:

Months	Actual Cost	Budget Cost	Deviation (%)
Before 000630	0	0	
0006	0	0	
0007	2 964 377	9 373 519	-68,4
0008	20 109 297	17 885 152	12,4
0009	31 758 872	26 295 122	20,8
0010	41 839 000	36 663 346	14,1
0011	52 452 109	39 331 285	33,4
0012	62 232 142	54 232 422	14,8
0101	74 272 771	64 581 860	15,0
0102	83 084 617	73 625 461	12,8



The derived template depends both on the View and the Variable settings.

If Variable is set to a selection variable (Actual or Budget in this example), you will get exactly the same result as if you had clicked on the selection variable element directly in the table. I.e. when View is set to Time you will get a Lines template, and when it is set to a custom dimension (e.g. Account), you will get the corresponding Components template, expanded to the first level, as already explained (see section “Clicking on a selection variable element” on page 168.).

If Variable is set to a formula variable, such as Deviation (%) in the illustration above, you will get a *formula expansion*. The constituent elements of the formula will be displayed, with every formula element (which may be a selection, or another, lower level, formula variable) displayed in one column each. Depending on if View is set to Time or a custom dimension you get the following derived templates:

View is set to Time. You get a Time Functions template, with the same reso-

Months	Actual Cost	Budget Cost	Deviation (%)
Before 001201	52 452 109	39 331 285	33,4
0012	62 232 142	54 232 422	14,8

lution as before. Change e. g. from Months to Weeks if you want another resolution.

Note that the formula elements will always be displayed, also in the case where they are not displayed in the template from which it is derived.

View is set to a dimension. Will produce a Components Functions temp-

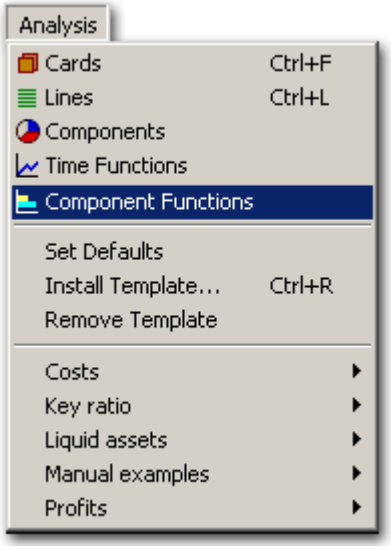
View Account	Actual	Budget	Deviation (%)
▾ COSTS	41 839 000	36 663 346	14,12
▸ Vehicle Expenses	7 843 327	6 138 358	27,78
▸ Oth Oper Expenses	19 501 923	17 579 623	10,93
▸ Labour	10 773 642	9 919 379	8,61
▸ Other Costs	2 810 828	1 473 616	90,74
▸ Depreciation	50 165	46 580	7,70
▸ Fin / Extraord Exp	859 115	1 505 790	-42,95

late. The dimension component will be expanded to the first level. All the formula elements will be displayed (same as when View is set to Time).

13

Analysis Templates

Component Functions



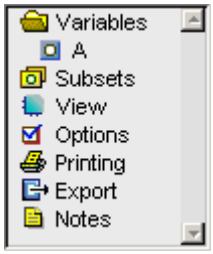
Introduction

This type of analysis template is very similar to Time Functions – instead of showing the results as functions of time, you get them as functions of any of the other – custom – dimensions. You can easily change between different views, e.g. from Accounts to Profit Centres. As in the case of Time Functions you typically define a number of selection variables. By default the scalar measure of these selections is the sum of all the selected values.

You can build a wide variety of formulas based on the selections. E.g deviations of actual values from budget values, ratios between profit and sales, etc.

The results are presented as functions of the components in the selected dimension. Choose between presenting them as a table of numbers (table view) or graphically (chart view).

Definition pages



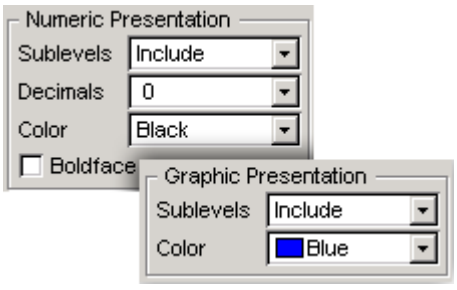
Variables

Selection variables

Define and name variables in exactly the same way as for Time Functions. See section “Defining selection variables” on page 154. Only the differences will be further explored here.

The first entry of the second drop-down menu has another name. It is called By Component, but corresponds directly to By Period, in Time Functions. You typically use the alternative From Start when you want a running total to be calculated.

To the right on the Variables definition page, you will find a few settings that are particular to Component Functions.
Depending on if you are working in table or chart view, they look slightly different:



Sublevels. The alternatives are Exclude and Include:

Exclude	Only values that are directly coded to the component, are aggregated in the measure for the component.
Include	All the sublimely values are included, also.

Example

In the common case where the measure on each component is the sum of all its values, the setting Sublevels : Include for the variable, will give the sum of all subsidiary component values, in addition to the directly coded values.

Formulas

These are built in the same way as formulas in Time Functions. Only the available operators differ in a few cases.

Operators. See "Available operators" on page 159. Compared to that list of operators, one is not applicable to Component Functions, and two new operators should be added:

- The Time operator (T) is not relevant for Component Functions.
- Only the operator **!** is special for Component Functions. It designates specifically the highest component, excluding all sublevels (e.g. in a summation of all the values).

Higher level values

✔According to formula
Sum of lower levels

Higher level values. If you have one variable with values that represent quantities, and another that represents prices, the sums of the price-times-quantity values are probably what you would like to see in the hierarchical sums.

Example

You want to calculate price times quantity for the products in product group 1:

	Qty	Price	Total
Group 1	9	45	115
Product A	5	10	50
Product B	3	15	45
Product C	1	20	20

The value 115 is the sum of the values beneath 115, in the same column. This is what you get if you set this option to Sum of lower levels. It can be spelled out as follows: "first calculate the formula values Total=Qty*Price, and then Sum them, hierarchically".

Otherwise (i.e. the default setting) you would get the table:

	Qty	Price	Total
Group 1	9	45	405
Product A	5	10	50
Product B	3	15	45
Product C	1	20	20

i.e. the values in the column Total are all calculated "horizontally", According to the formula, including the Group 1 level values; e.g. no summation vertically, over the hierarchy. The Total will be 9*45=405, which in this case is not very meaningful.

Subsets

See section “Subsets” on page 83.

View

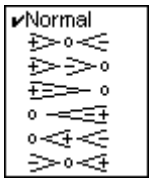
See section “View” on page 143.

Options

This definition page has a number of settings, and the actual settings available depends on whether the table view or the chart view is active:

Sorting

Sorting order. The alternatives are:



They are exactly the same as the sorting criteria in Components. See “Sorting” on page 174.

Sorting criterion. You can choose any of the displayed variables/formulas as the sorting criterion.

Grid Lines

Allows you to display grid lines both horizontally and/or vertically, to make the tables and graphics easier to interpret. The settings are the same as the corresponding settings for the Components template (see “Grid Lines” on page 147).

Other controls in Options

	Changes between different ways to display the components hierarchy.
	Selects one of a number of bar chart layouts. Only available in chart view.
	The value axis direction is reversed; in graphical display, only.
	Line spaces can be set from 1 to 6 lines.

Printing, Export, Notes

See section “Printing” on page 120, “Export” on page 121, and “Notes” on page 121.

Working interactively in the output area

To drill down in the output area, you work in exactly the same way as for Time Functions.

Both numerical and graphical elements are”clickable”:

- When you click on a value defined by a selection you get the option to choose along which dimension you want the details displayed – the built-in Time dimension or one of the custom dimensions:
  - Time produces a Lines template
  - a custom dimension will give a Components template showing data along the chosen dimension, expanded one level
- Clicking on a formula value gives you the option to get a formula expansion, i.e. all the elements of the formula will be displayed. Alternatively you can specify that any single one of the underlying selection or formula variables will be displayed in more detail. If you choose a selection variable, the result is equivalent to clicking directly on a value defined by the selection, and the result will be as described above. Choosing a formula variable will produce a regular formula expansion. See section “Clicking on a selection variable element” on page 167.

Other Component Functions controls

View

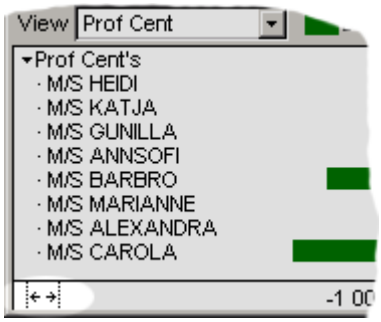
You can easily change the dimension, along which all the values are displayed:

Instead of installing a number of templates of a similar kind, it is often better to install one single template, and then simply change this pop-up to get data presented along different dimensions.

Automatic adjustment

This control is only available in chart view, in the lower left corner of the window.

If the bar chart is not optimally adjusted to the window, you just click on the adjustment symbol.



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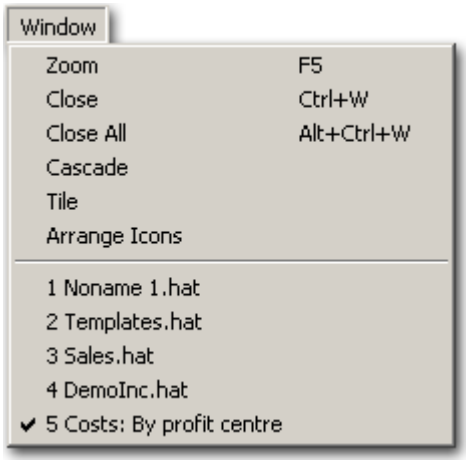
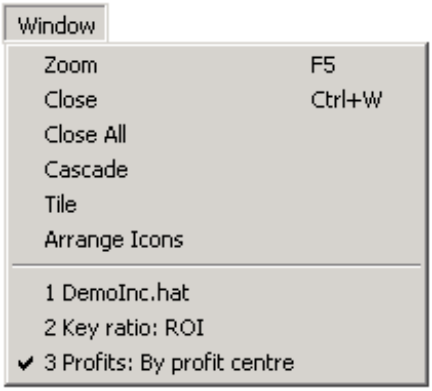
The Window Menu



Introduction

The first part of the Window menu consists of operations on individual or groups of windows, the second part is a list of the currently open HAT windows:



Window commands

Zoom ... etc. are all standard operating system commands. Only one of them requires a special comment.

Close All

Closes all open windows, but for the database window. If you have a lot of open windows, this command provides a quick way to close them all, in one step.

MacOS
The Window commands are somewhat different:
Zoom adapts the window to show as much as possible, using a minimum of screen area.
Maximize expands it to the entire screen. You can also combine holding down the Alt-key while clicking the zoom box, to achieve this.
To close all windows with one command, click the close box while pressing the Alt-key.

Selecting a window

Use the Window menu to quickly switch between HAT windows. The currently active window is marked with ✔ .

MacOS
If, and only if, more than one database is opened by the same HAT application, the open windows will be grouped hierarchically under its HAT-file name.

Other aspects

Memory requirements

Each open analysis window is treated as an “analysis at work”, i.e. it uses space in the computer internal memory. You should therefore avoid having too many HAT windows open at the same time.

Alternative closing commands

You can also use the close box, if the window has one.

The Enter key can be used to close a `Card` window.

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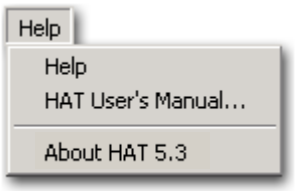
The Help Menu



Introduction

This menu contains three elements:

- Help ...
- HAT User´s Manual ...
- About HAT ...

Commands in the Help Menu

Help...

Much of what you will find in this manual is also covered in HAT Help. Use HAT Help as an instant source of information in the moment a question arises. When you activate the Help-command, you get the Help for HAT window. A click on the Contents window button, displays a systematic view that follows the HAT menu logic:

For further information on how to use HAT Help, see the instructions in the Help itself.

MacOS
No specific Help is available for Macintosh. Macintosh users are referred to this manual for information on how to operate HAT.

HAT User´s manual ...

This menu element is only available if the file HAT Users manual.pdf resides in the same folder as the HAT program. To be able to open and read this file you have to have Acrobat Reader installed on your computer. Acrobat Reader is a free software from Adobe Systems Inc. You can download the latest version from many Internet sites, e.g. from

http://www.adobe.com

About HAT...

About HAT gives general information about the installed HAT version , the license you are using, etc.

MacOS

The pre-installed *Preview* application can also be used to view the HAT User´s manual.
You will find About HAT in the HAT application menu in MacOS X, and in the Apple menu in MacOS 8/9.