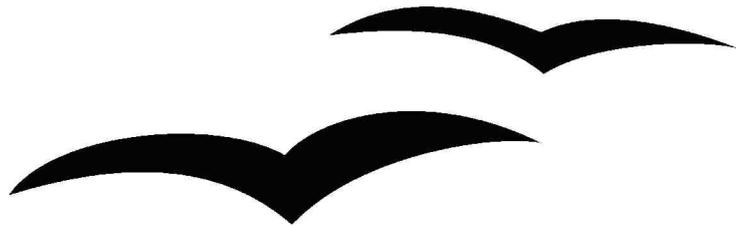# OpenOffice.org
The Open Source Office Suite

Project-Management with OpenOffice.org 2.0 Calc

[Projekt-Management und Gantt-Diagramm mit OpenOffice.org 2.0 Calc and Comment créer un diagramme de Gantt avec OpenOffice.org]

[Version 2.1]

Content

Copyright and trademark information

Modifications and updates

Version	Date	Description of Change
[0.9]	[2005-06-06]	dhi: first version (in German)
[1.0]	[2005-11-09]	grs: Initial edition issued for comment
[1.1]	[2005-11-12]	ss: Proofed edition issued for publication
[2.0]	[2006-05-22]	dhi: - added levels - unique ID alphanumeric instead of numeric - separation of predecessors changed from space to ";" - Columns can be rearranged freely
[2.1]	[2006-05-28]	dhi: - added resource usage analysis - some improvements

Overview

The tasks of a project can be quite complex and dependent on each other. A project management tool allows to divide a project into small sub-units, to visualize the dependencies so that parallel processes can be individuated, the overall processing time determined and progress tracked.

Gantt Charts are a way to graphically show the progress of a project.

This document describes the use of the Calc template "PjM_Calc" to perform simple project management tasks. The Calc sheet contains macros that perform the automatic scheduling of tasks. and the evaluation of resource usage.

In this document a relocation-process to another city is used as an examples and is based upon the accompanying Calc template, "PjM_Calc.ots", which is distributed together with this documentation.
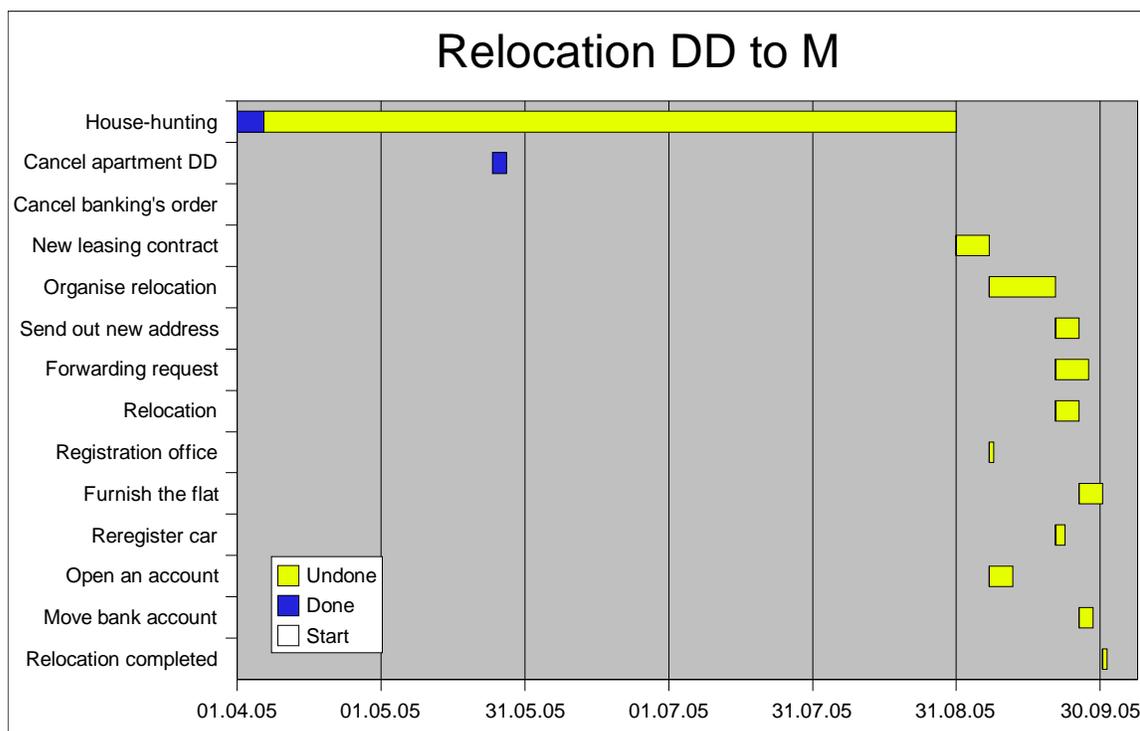
Illustration 1: The finished example

In illustration 1, the subtasks of the relocation-process appear on the y-axis, and the time line on the x-axis. The bars show when a task should start and when it will be finished.

For those not familiar with project management terms, see http://www.apm.org.uk/page.asp?categoryID=4&subCategoryID=29&pageID=0 for definitions.

The Template

The template consists of three sheets:

- "Tasks" – contains the project tasks
- "Gantt" – contains the Gantt chart
- "Resources" – contains information on the resources used

> Further custom sheets can be added, but do not rename or delete these three sheets.

The template contains an example project to facilitate the usage

It also includes the macros "Autoschedule" and "Resource Usage" that are explained in detail later-on.

> This template uses macros and upon opening displays a security warning.
> Accept the usage of macros for full functionality.

The sheet "Tasks"

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1				Autoschedule			Example Project Relocation							
3	Info	ID	LVL	Activity	Start	Dur.	End	Progress	Done	Todo	Predecessor	Resource	Effort	Remarks
4	🖳		1	Today -->	07.05.06	20	27.05.06	0%	0	20				
5	✔		1	Project management	07.05.06	45	21.06.06	100%	45	0		me	12,50%	
6	☒		1	original location	07.05.06	20	27.05.06	37%	7	13				
7	✔	100	2	House-hunting	07.05.06	14	21.05.06	100%	14	0		Agency	3	
8	☒	200	2	Cancel old apartment	21.05.06	3	24.05.06	10%	0	3		Agency	0,1	
9	☒	300	2	Cancel banking's ...	24.05.06	3	27.05.06	0%	0	3		me	0,5	
10	☒		1	new location	21.05.06	31	21.06.06	8%	2	29				
11	☞	400	2	New leasing contract	21.05.06	7	28.05.06	80%	6	1		Agency	1	
12		500	2	Organize relocation	28.05.06	14	11.06.06	0%	0	14	400;200	Mover	5	
13		600	2	Send out new ...	11.06.06	5	16.06.06	0%	0	5	400;500	me	2	
14		650	2	Forwarding request	11.06.06	7	18.06.06	0%	0	7	400;500	me	0,5	
15		700	2	Relocation	11.06.06	5	16.06.06	0%	0	5	400;500	Mover	5	
16		800	2	Registration office	28.05.06	1	29.05.06	0%	0	1		me	0,5	
17		900	2	Furnish the flat	16.06.06	5	21.06.06	0%	0	5		Mover	4	
18		1000	2	Register car	11.06.06	2	13.06.06	0%	0	2	800;500	me	0,5	
19		1100	2	Open an account	28.05.06	5	02.06.06	0%	0	5		me	0,2	
20		1200	2	Move bank account	16.06.06	3	19.06.06	0%	0	3	700;1100	Bank	1	
21		9999	1	Relocation completed	21.06.06	0	21.06.06	0%	0	0	900;1000;1200			
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
32														

\ Tasks / Gantt / Resources /

Abbildung 2: Sheet Tasks

This sheet contains the details of the projects and the activities.

It has a predefined data range "TaskList" that is used by the tool. Do not remove this range. When you add activities make sure the are included in this range. This is best done by adding activities always <u>below the first and above the last</u> activity.

Columns

- "Info" - Information on the progress of the task

  ☞ The task has begun and is on track according to the progress

  ✔ The task is completed

  ☒ The task is due and not on schedule, this means, that the end-date is prior to the current date.

  blank Task is not due yet, it is not marked.

- "ID" - identifier of the task

- "Level" – tasks can be grouped with this outline level

- "Activity" - description of the task

- "Start" - start-date of the task

- "Duration" - planned or actual duration of the task in calendar days

- "End" - end-date of the task. This gets calculated based on the start-date and duration.

- "Progress" in percentage
- "Done" - Duration * progress
- "Todo" - expected time remaining: Duration - Done
- "Predecessor" - List of tasks, which have to be completed, before this task can start. Separation is made by ";"

> *Note: The maximum number of predecessors is limited to 9.*

- "Resource" – Identification of the resource assigned to that task
- "Effort" – Effort to perform the task in days or percent of the duration
- "Remarks", ... - Further custom column, that are not interpreted by the tool.

The column titles (here located in the third row) can be labeled freely. The positions of the columns can be changed at your choice.

The meaning of the dates is different to what you might be used to from commercial project management tools. For instance take an activity starting on 7-May and ending on 21-June, so lasting 14 days. This means it starts at 7-May 0:00h and ends at 21-June 0:00h. Other more sophisticated tools are using calendars so the same task starts at 7-May 8:00h and ends at 20-June 17:00h.

Rows

You can add rows above the table for headers and below for comments but always keep the two heading rows together with the data.

The first header line (in the template the hidden row 2) is used by the macros to identify the columns. Do not change it. You may keep it hidden. If you copy a column (e.g. to create a baseline) delete the content of this row of that column to avoid unexpected results.

It is recommended to use the last row for the end of the project. Insert new tasks above so that they are displayed automatically in the chart.

The sheet "Gantt"

This sheet contains the Gantt chart. It must be located as unique diagram in the sheet "Gantt".
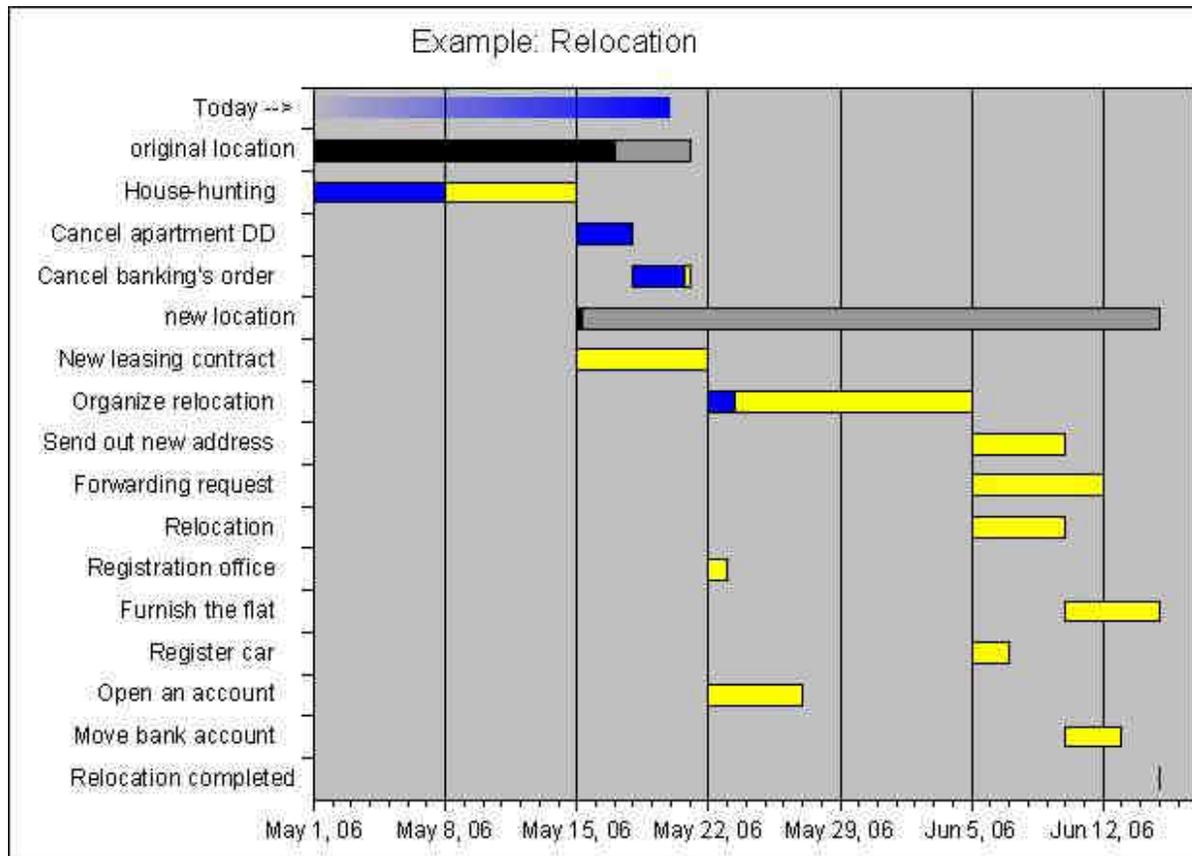
Abbildung 3: Gantt-chart example

Summary tasks are indicated with black and gray bars, sub tasks in blue and yellow.

Black and blue stand for the accomplished part of the task, whereas gray and yellow indicate the part, that has still to be done.

The horizontal time axis can be scaled e.g. to have a major scaling in weeks, and the sub scaling in days.

> Occasionally the bars are not visible. The root cause is still not understood (it could be a bug in OpenOffice.org or caused by the macro).
> Double click on the Gantt chart which shows the "Format" menu bar. Turn on the legend and assign a color to the data for "todo" and for "done". You can hide the legend again if you want to.

The sheet "Resources"
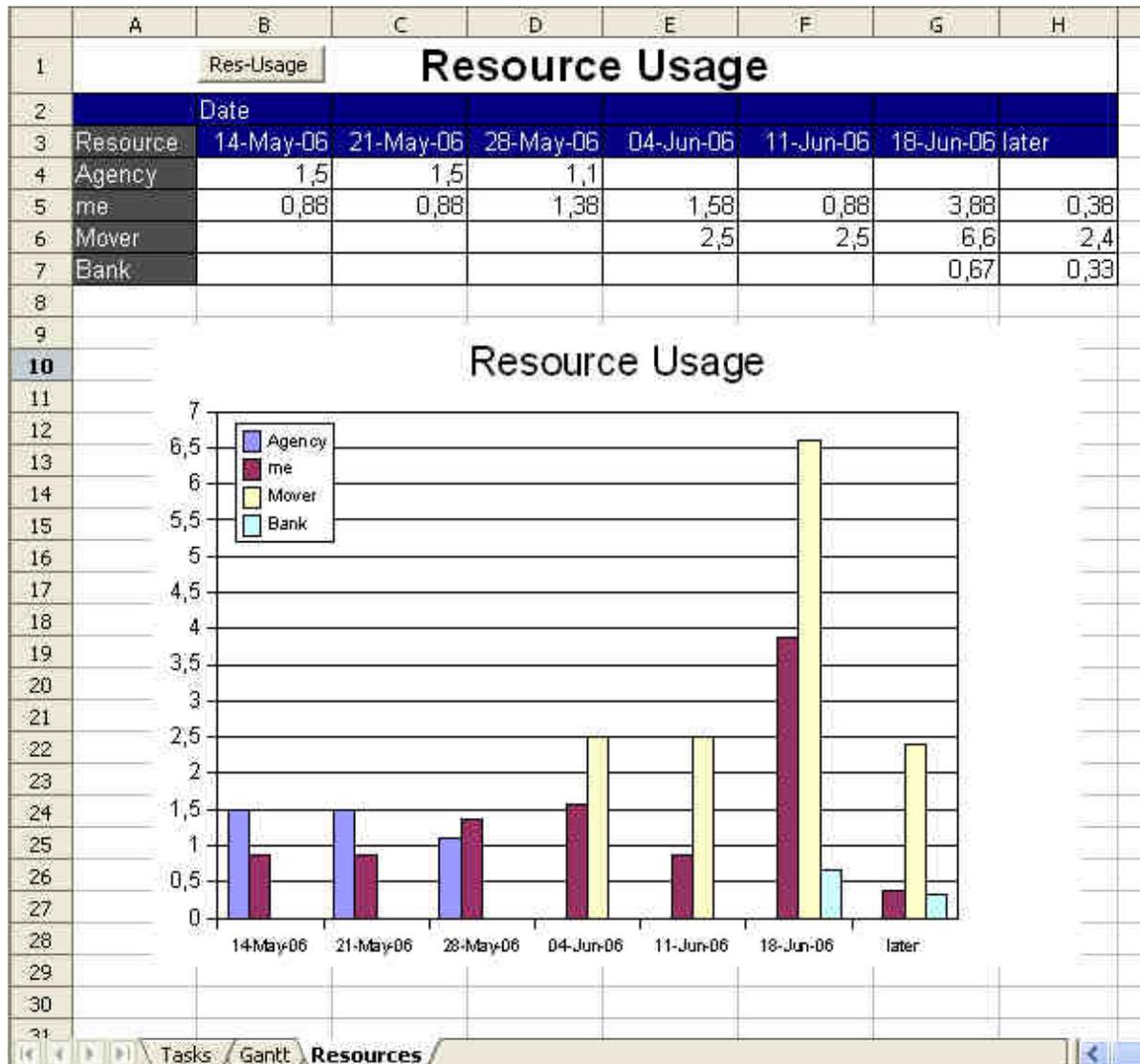
Abbildung 4: Sheet "Resources"

The sheet "Resources" allows to calculate the total effort or usage during specific periods of time.

It has a list of resources (here "A4:A7") and time slots (here "B3:H3"). The macro distributes the corresponding effort in these time slots.. The data range "ResourceUsage" is used by the macro to store the calculated values. The last column always contains the effort of the activities after the date of the previous column independently of the header.

The usage below a date (e.g. 21-May) indicates the value from the previous date until 21-May 0:00h or in other words until but not including 21-May!

You can add rows above the table for headers and below for comments but always keep the heading row together with the data.

The graph is an example, how this data can be visualized.

The Macros

The modules and macros are written in OpenOffice.org BASIC and are located in the Calc template.

"AutoSchedule"

The macro "AutoSchedule" performs the following process:

- AutoFill: fills in data if missing
    - ○ Duration or end date are set to be calculated
    - ○ Progress is set to 0
    - ○ Done and ToDo formulas are set
    - ○ Level is set to the value of the row above
    - ○ indents task names for sub-tasks
- Analysis of dependencies and sets start dates of depending tasks to the last dates of the predecessors.
- Where the task is finished (Progress = 100%) determines the duration
- Update of the column info
- Update of data for summary tasks
    - ○ Start date is the first date of all sub-tasks
    - ○ end date is the last date of all sub-tasks
    - ○ Progress is the average value of all sub-tasks
- Update of Gantt-Chart

The autoschedule is performed ~~starting in row 3 until the last visible row~~ on the data range "TaskList".

The update of the Gantt-Chart is performed for all <u>visible</u> tasks (see also tips and tricks).

During the execution of the macro, a progress bar is shown. After having performed many changes in the task list, the updating of the Gantt chart as the last process step might take some time.

"ResourceUsage"

- Loops the resources in the sheet "Resources"
    - ○ searches the tasks with that resource name in the task list
    - ○ calculates the total effort per time slot and summarizes per resource

Using the tool – Managing a Project

The usage of this tool is shown with the example of a relocation to another town.

Creating a new project

The first step is to create a list of all activities. They can be grouped with the column "LVL", e.g. house-hunting, and canceling of old apartment and banking's order are part of the group activity "original location":

Info	ID	LVL	Activity
			Autoschedule
		1	Today -->
		1	Project management
		1	original location
	100	2	House-hunting
	200	2	Cancel old apartment
	300	2	Cancel banking's order
		1	new location
	400	2	New leasing contract
	500	2	Organize relocation
	600	2	Send out new address
	650	2	Forwarding request
	700	2	Relocation
	800	2	Registration office
	900	2	Furnish the flat
	1000	2	Register car
	1100	2	Open an account
	1200	2	Move bank account
	9999	1	Relocation completed

Tasks / Gantt / Resources /

Illustration 5: List of activities

Next insert the start-date for the non-dependent tasks, as well as duration and expected end-date:

	A	B	C	D	E	F
1	**Info**	**No.**	**Activity**	**Start**	**Duration**	**End**
2		100	House-hunting	01/03/05		31/08/05
3		200	Cancel apartment DD	25/05/05	3	28/05/05
4		300	Cancel banking's order		3	
5		400	New leasing contract		7	
6		500	Organise relocation		14	
7		600	Send out new address		5	
8		650	Forwarding request		7	
9		700	Relocation		5	
10		800	Registration office		1	
11		900	Furnish the flat		5	
12		1000	Reregister car		2	
13		1100	Open an account		5	
14		1200	Move bank account		3	
15		9999	Relocation completed		1	

Illustration 6: Insert start- and end-date

House-hunting starts on 01/03 and should be finished by 31/08. For all the other tasks the duration is given.

Now, define the dependencies of the tasks. The relocation (700) for example can not start before the new leasing contract is signed (400) and the relocation is organized (500). The tasks 300-9999 do have dependencies, thus there are no predefined start-dates for these tasks.

	A	B	C	D	E	F	G	H	I	J
1	Info	No.	Activity	Start	Duration	End	Progress	Done	Undone	Predecessor
2		100	House-hunting	01/03/05		31/08/05	20%	0	0	
3		200	Cancel apartment DD	25/05/05	3	28/05/05	100%	3	0	
4		300	Cancel banking's order		3		100%	3	0	200
5		400	New leasing contract		7			0	7	100
6		500	Organise relocation		14			0	14	400 200
7		600	Send out new address		5			0	5	400 500
8		650	Forwarding request		7			0	7	400 500
9		700	Relocation		5			0	5	400 500
10		800	Registration office		1			0	1	400
11		900	Furnish the flat		5			0	5	700
12		1000	Reregister car		2			0	2	800 500
13		1100	Open an account		5			0	5	400
14		1200	Move bank account		3			0	3	700 1100
15		9999	Relocation completed		1			0	1	900 1000 1200

Illustration 7: Define dependencies

As 20% of house-hunting are already done, and the current apartment is already canceled, the progress is 20% and 100% respectively.

At this point call the macro by clicking on the button "Autoschedule". The duration and end-dates are calculated, and the column start is completed.

	No.	Activity	Start	Duration	End	Progress	Done	Undone	Predecessor	Update
1										
2	100	House-hunting	01/03/05	183	31/08/05	20%	36.6	146.4		
3	200	Cancel apartment DD	25/05/05	3	28/05/05	100%	3	0		
4	300	Cancel banking's order	28/05/05	98	03/09/05		0	98	200	
5	400	New leasing contract	31/08/05	7	07/09/05		0	7	100	
6	500	Organise relocation	07/09/05	14	21/09/05		0	14	400 200	
7	600	Send out new address	21/09/05	5	26/09/05		0	5	400 500	
8	650	Forwarding request	21/09/05	7	28/09/05		0	7	400 500	
9	700	Relocation	21/09/05	5	26/09/05		0	5	400 500	
10	800	Registration office	07/09/05	1	08/09/05		0	1	400	
11	900	Furnish the flat	26/09/05	5	01/10/05		0	5	700	
12	1000	Reregister car	21/09/05	2	23/09/05		0	2	800 500	
13	1100	Open an account	07/09/05	5	12/09/05		0	5	400	
14	1200	Move bank account	26/09/05	3	29/09/05		0	3	700 1100	
15	9999	Relocation completed	01/10/05	1	02/10/05		0	1	900 1000 1200	

Illustration 8: Calculated duration

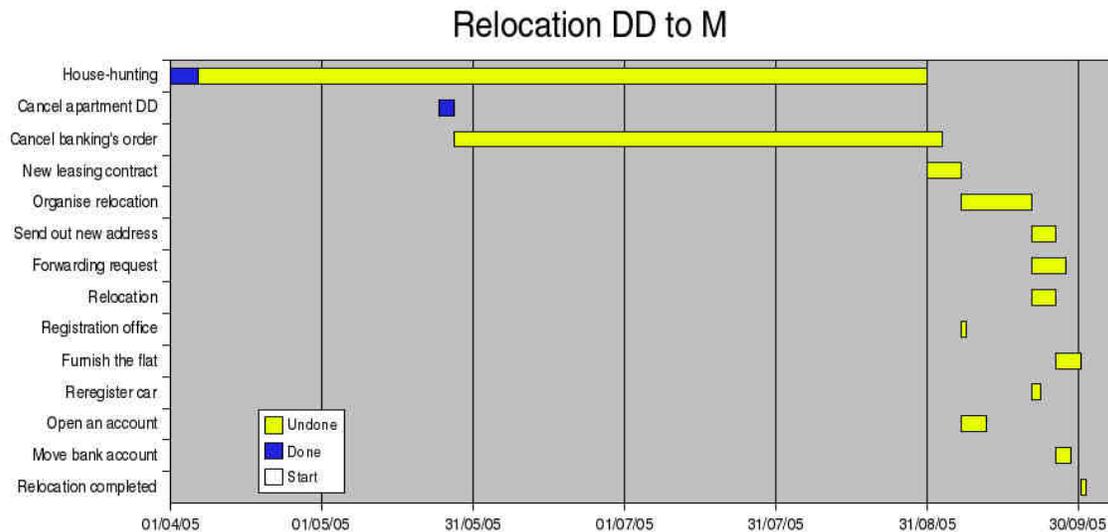Also the Gantt-Chart is updated to show your activities as function of time:

Illustration 9: The appropriate chart

The organization of the relocation, the registration at the office and the opening of an account can be done simultaneously. On the other hand the bank account cannot be moved immediately, because the current apartment is not yet relocated.

Project controlling

When you begin working on a task, insert the start date in the column "`Start`". Set the progress to a value greater than zero (1% e.g.), so that "**`AutoSchedule`**" will no longer change this date.

If a task is completed, insert the real `End`-date, delete the duration and set the progress to 100%. When calling "**AutoSchedule**" the next time, the required duration will be calculated.

After each change in the table,invoke the macro "**AutoSchedule**" to update the table accordingly.

The "Info" column shows the current status of the project:

	A	B	C	D	E	F	G
1	Info	No.	Activity	Start	Duration	End	Progress
2	☛	100	House-hunting	01/03/05	183	31/08/05	90%
3	✓	200	Cancel apartment DD	25/05/05	3	28/05/05	100%
4	✖	300	Cancel banking's order	28/05/05	3	31/05/05	
5		400	New leasing contract	31/08/05	7	07/09/05	
6		500	Organise relocation	07/09/05	14	21/09/05	
7		600	Send out new address	21/09/05	5	26/09/05	
8		650	Forwarding request	21/09/05	7	28/09/05	
9		700	Relocation	21/09/05	5	26/09/05	
10		800	Registration office	07/09/05	1	08/09/05	
11		900	Furnish the flat	26/09/05	5	01/10/05	
12		1000	Reregister car	21/09/05	2	23/09/05	
13		1100	Open an account	07/09/05	5	12/09/05	
14		1200	Move bank account	26/09/05	3	29/09/05	
15		9999	Relocation completed	01/10/05	1	02/10/05	

Illustration 10: Table during project-controlling

☛   House-hunting has begun and is on schedule according to the progress

✓   The apartment has already been canceled, the task is completed.

✖   Cancelling the bank's order is due and not on schedule, this means, that the end-date is prior to the current date.
All the other tasks are not due yet, they are not marked.

Resource planning

To get an overview of the usage of your resources for instance to see whether they are over-allocated use the columns "Resource" and "Effort" in the "Tasks" sheet together with the sheet "Resources".

Enter the real working time to be spent for each activity. This can be expressed in days or in a percentage to the duration:

	A	B	C	D	E	F	G	L	M
1				Autoschedule			**Example Project Relocation**		
3	**Info**	**ID**	**LVL**	**Activity**	**Start**	**Dur.**	**End**	**Resource**	**Effort**
4			1	Today -->	07.05.06	21	28.05.06		
5	✓		1	Project management	07.05.06	45	21.06.06	me	10%
6			1	original location	07.05.06	20	27.05.06		
7	✓	100	2	House-hunting	07.05.06	14	21.05.06	Agency	3
8		200	2	Cancel old apartment	21.05.06	3	24.05.06	Agency	0,1
9		300	2	Cancel banking's order	24.05.06	3	27.05.06	me	0,5
10			1	new location	21.05.06	31	21.06.06		
11		400	2	New leasing contract	21.05.06	7	28.05.06	Agency	1
12		500	2	Organize relocation	28.05.06	14	11.06.06	Mover	5
13		600	2	Send out new address	11.06.06	5	16.06.06	me	2
14		650	2	Forwarding request	11.06.06	7	18.06.06	me	0,5
15		700	2	Relocation	11.06.06	5	16.06.06	Mover	5
16		800	2	Registration office	28.05.06	1	29.05.06	me	0,5
17		900	2	Furnish the flat	16.06.06	5	21.06.06	Mover	4
18		1000	2	Register car	11.06.06	2	13.06.06	me	0,5
19		1100	2	Open an account	28.05.06	5	02.06.06	me	0,2
20		1200	2	Move bank account	16.06.06	3	19.06.06	Bank	1
21		9999	1	Relocation completed	21.06.06	0	21.06.06		
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									

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Abbildung 11: Resource Efforts (some columns were hidden)

An activity "project management" was added because I intend to spend 10% of my time on the controlling. House hunting will take 2 weeks but the agency will only work 3 days on it etc.

Next switch to the "Resources" sheet and create the table with the list of resources and the periods of interest.

> If you need to add date-columns or resources make sure that they are added below the first entry or above the last one to ensure that the macros include them in the calculations.

Calling the function "resource usage" will fill this table.

Between 21-May-06 until but not including 28-May-06 the agency and myself will work on the project 1.1 days and 1.2 days respectively.

	Res-Usage	Resource Usage					
	Date						
Resource	14-May-06	21-May-06	28-May-06	04-Jun-06	11-Jun-06	18-Jun-06	later
Agency	1,5	1,5	1,1				
me	0,7	0,7	1,2	1,4	0,7	3,7	0,3
Mover				2,5	2,5	6,6	2,4
Bank						0,67	0,33

Abbildung 12: Table resource usage

You can create graphics from this table such as the following one:
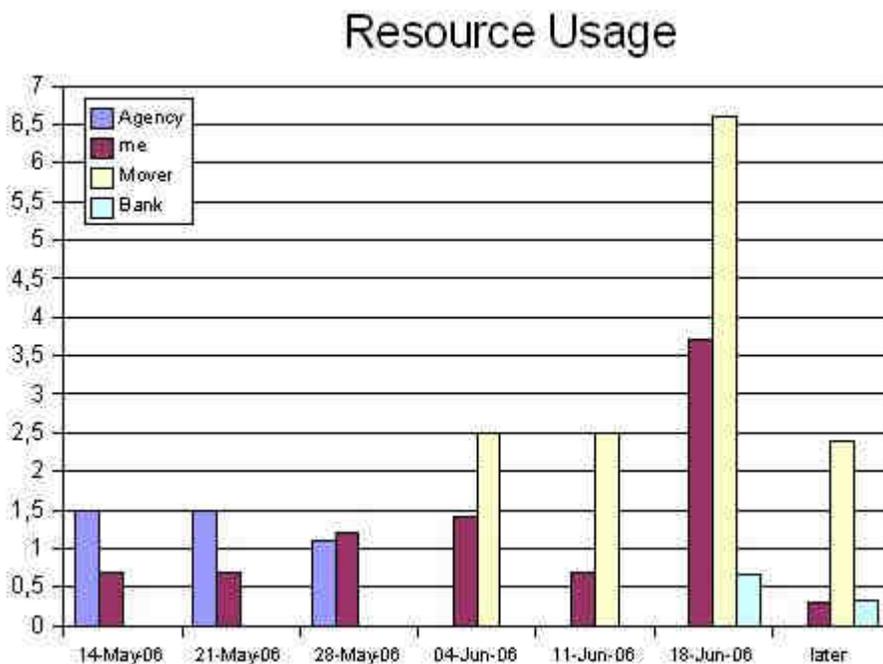
Abbildung 13: Bar Chart Resource Usage

Tips and tricks

Today bar

Add on top of your task list a row to indicate the current date in the Gantt chart. This has already been set in the template. Set "level" to "1", "start" to the minimum of all start dates ("=min(...)"), "end" to the current day ("=today()") and "duration" to the difference between end and start ("=G3-E3"). The color can be set with the value of the "progress" (yellow when 0%, blue when 100%).

Precise planning

The example shows a schedule on a daily basis. It is also possible to plan on hourly basis, even minutes and seconds. Simply set the cell format of the relevant "start" and "end" cell to "time" (e.g. "dd-mm-yy h:mm:ss") and also that of the "duration" to "time" (e.g. "hh:mm:ss").

Hiding tasks

To simplify the Gantt chart, you may want to hide some tasks. For instance the sub-tasks that are already completed can be hidden, indicating only the summary task. This will also hide these tasks in the Gantt chart. Make sure you call the "Autoschedule" macro to set the correct colors for the tasks.

"Autoschedule" will still analyze these hidden tasks.

Effort for project management

As project manager you may want to add a task for your activity to take into account your daily work to follow up.

Create an activity for this, set the effort to let's say "10%", set "Start" to the minimum of all start dates ("=min(...)"), "End" to their maximum ("=max(...)") and duration to the difference.

Using the chart as a graphic in other applications

To use the Gantt-chart as a picture in another application, save the whole Calc document as HTML. This generates not only the HTML-file, but also a jpeg-file containing the chart which can then be included in other documents, such as an OpenOffice.org impress presentation.

> Remember to give the graphic a more descriptive name than the name suggested when the document is exported to HTML so that it can be found easily later

Appendix: Generation of a Gantt-Chart

Starting the Process

To chart a project, all the sub-tasks must first be collected in a spreadsheet. In this simple example there is the name of the task, the start-date and the duration in calendar days:

Illustration 14: Task list

This simplified project consists of eight subtasks "Task 1" to "Task 8".

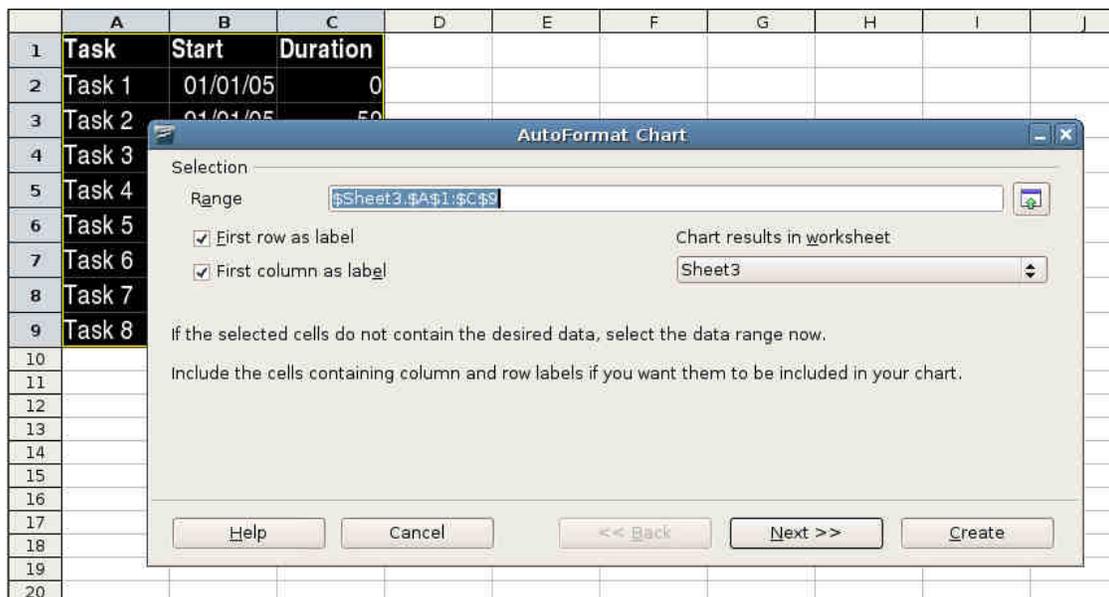Next, begin creating the chart by selecting **Insert—Chart:**

Illustration 15: Create the chart

From the dialogue "`AutoFormat Chart`" define the selection range. Neither the first row (containing the column label) nor the first column (containing the task name) should be included as data.
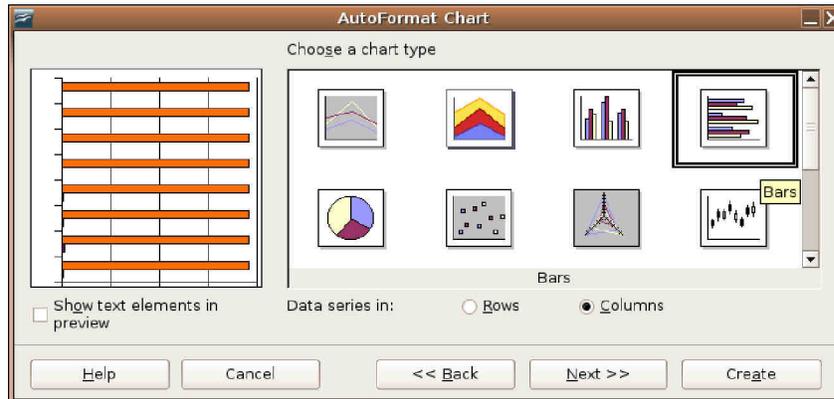
Click "`Next >>`" , and choose the Chart type:

Illustration 16: Choose chart type

Choose the horizontal bar-chart and click "`Columns`" to indicate that the data are arranged in columnar form.

Note: This changes the assignment of the axis in OpenOffice.org Calc. Now the horizontal axis is called "Y" and the vertical axis is called "X".

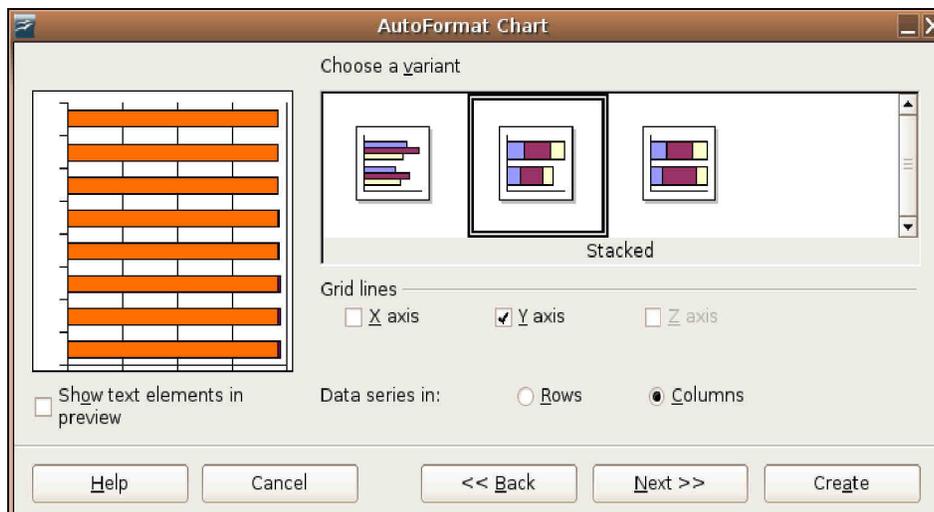Click "`Next >>`" and choose the variant "`Stacked`":

Illustration 17: Create chart with stacked bars

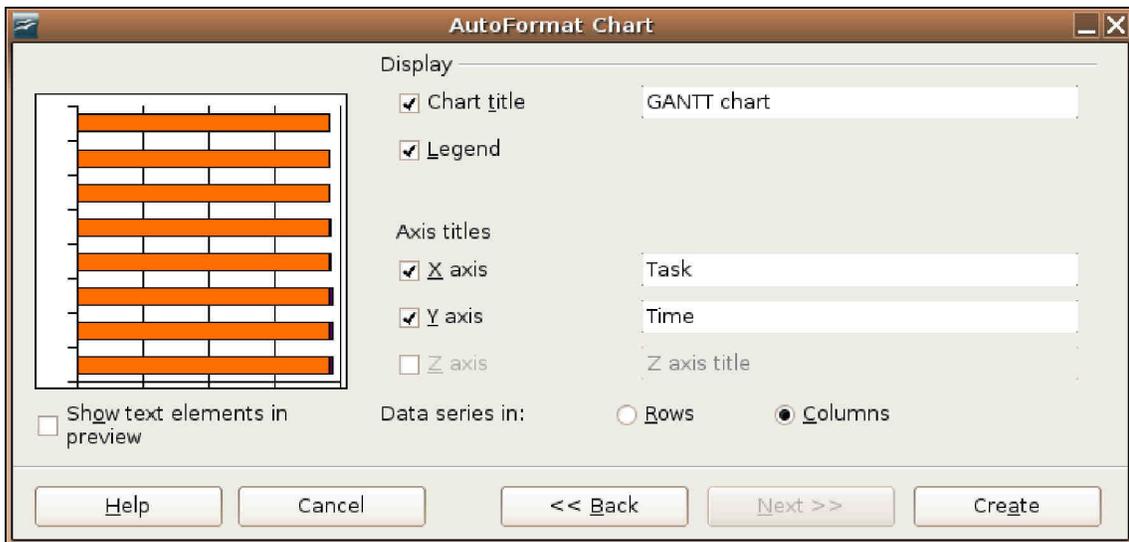Click "`Next >>`" once again and enter chart and axis titles:

Illustration 18: Adapt chart labeling
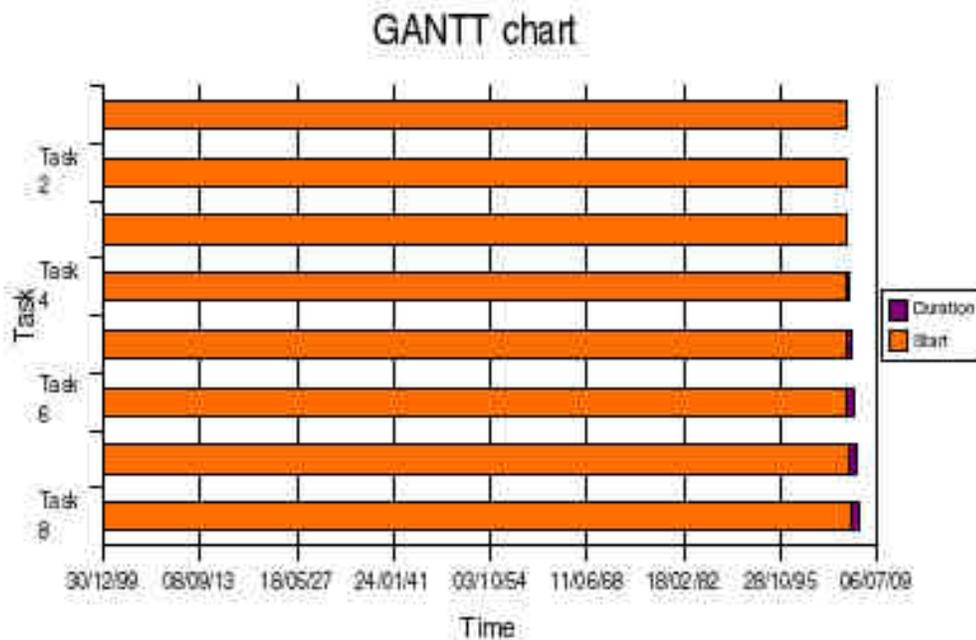
The first Gantt Chart appears as follows:

Illustration 19: Bar chart

The task names are on the vertical axis ("`Task 1`" to "`Task 8`") and the time line is on the horizontal axis.

Converting the simple bar-chart into a Gantt chart

In order to edit the properties of an element in the diagram,. double-click the chart to select it. Next, right-click to open the context menu and gain access to the chart properties.
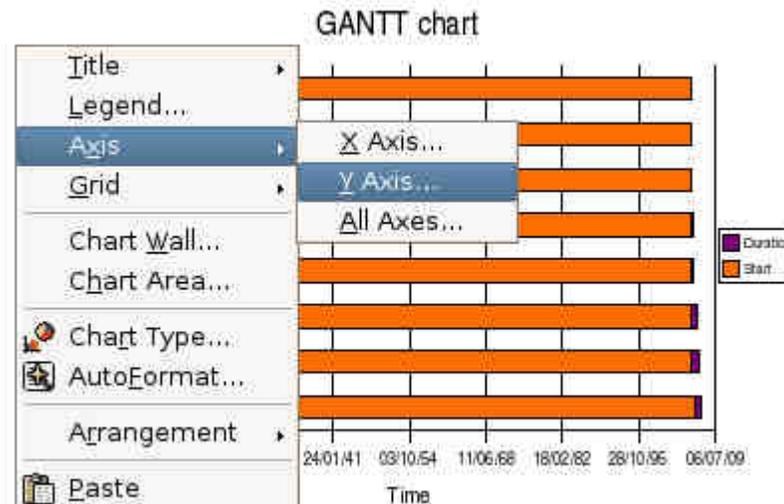

Illustration 20: Edit diagram properties

Note: *Ensure that no element in the diagram is selected, because otherwise the axis-properties can not be edited*

Select the `y-axis`, which now is the horizontal time line. (One could also select the horizontal axis using a left-click then right-click to open the context menu and finally choose **Object Properties ...** to format this axis.)

Set the **Minimum** to the real start-date, In this example this is 01/01/05. Furthermore the axis should get the start date, so check the checkbox "Automatic" in the line "Axis at":
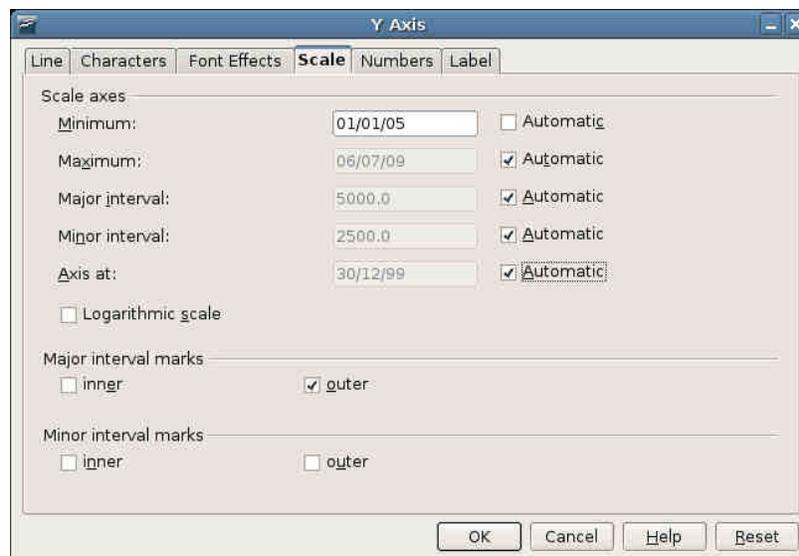

Illustration 21: Adjust the time line
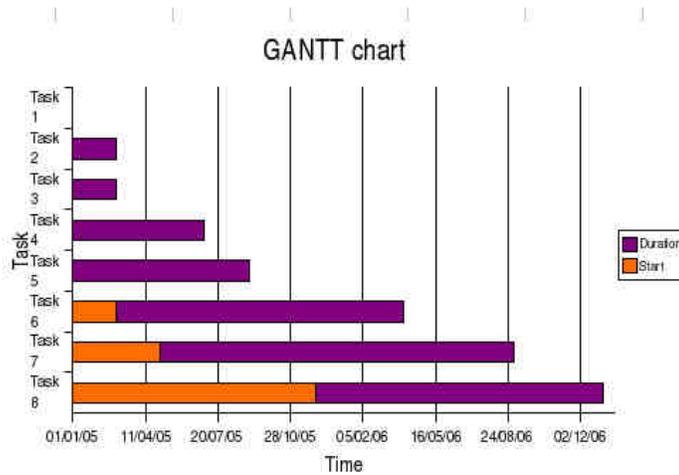
This produces a chart as follows:

Illustration 22: Gantt chart

The orange bar symbolizes the time up to the start of the task. This bar should be made invisible. For this select the orange bar with a left-click, and then open its **Object Properties** after a right click.

Under the tab "`Borders`" choose **Style – Invisible**, and under the tab "`Area`" choose **Fill – None**. Now the chart presents itself as follows:
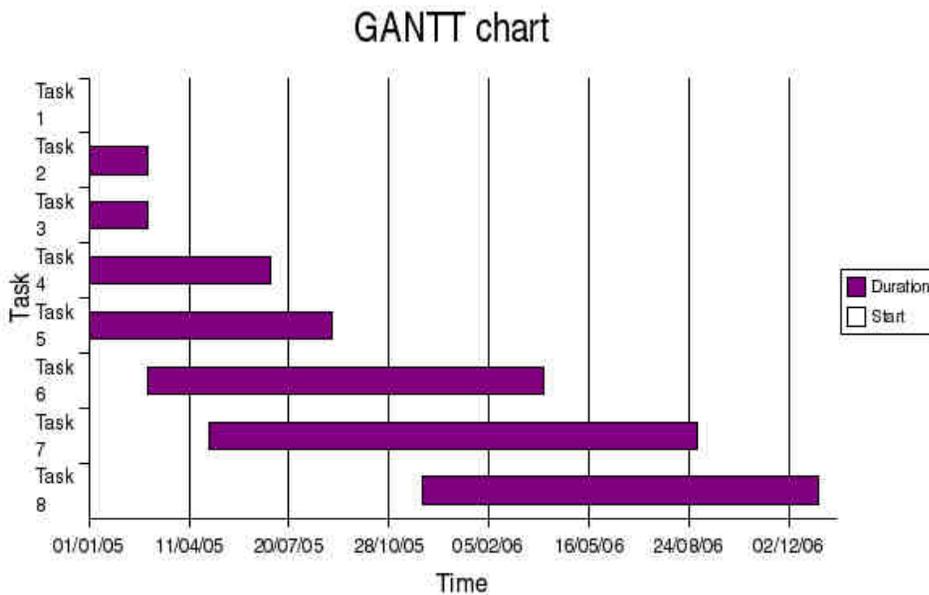

Illustration 23: The completed Gantt chart

Appendix: Software documentation

Module "License"

The module "License" contains the license conditions for all modules and macros for this template.

Module "Commons"

This module contains those functions that are common to the various modules in this template

Key variables and constants

Dim Col_No() as integer
- contains the column number of the information in the following indicies
- 0:INFO, 1:ID, 2:LVL, 3:Name, 4:Start, 5:Duration, 6:End, 7:Progress, 8:done, 9:todo, 10: predecessor, 11:resource, 12:effort

Sub InitDocument()
- initializes the document

Sub DoneDocument()
- terminates the usage of the document

Sub InitTaskTable(oSheet)
- initializes the sheet "Tasks"

Progress Bar

Sub InitProgressBar(iNumSteps%)
- Loads the progress bar, sets the step width

Sub IncreaseProgressBar(iValue)
- increase value of progressbar bar

Sub DoneProgressBar()
- hides the progress bar

Module "AutoSchedule"

Main Functions

Sub Init()
- initialization routines

Sub AutoFill (oWhichSheet, iFirstRow, iLastRow)
- fill in missing data in table

Sub AnalyseDependencies(Row%, prec$)
- set start date according to dependencies

Sub SetSumTaskDates
- iterates through the task list and calls SetSumTaskDatesIt(i&)

    Function SetSumTaskDatesIt(i&) as long
    - sets the dates (start, duration, end) for summary tasks – iteration
    - returns: index of next task

Sub SetFinishedDuration(oWhatSheet as Object, iRowNo as integer)
- sets the duration for finished tasks

Sub SetInfo(oSheet as object, iRowNo as Integer)
- sets the info data

Sub Done()
- cleaning up, e.g. closing Progress bar window

Sub UpdateGantt
- update Gantt graph

Sub Functions

Function CompareTasks(thisCol as integer, Row1 as long, Row2 as long) as integer
- Compares data in Column thisCol of row Row1 and Row2
- returns:
    - -1: if value of Row1<Row2,
    - 1: if value of Row1>Row2,
    - 0: if value of Row1=Row2,
    - 2: if Row1 or Row2 are beyond end

Function GetCellName(oCell as object) as string
- returns the name of a cell (e.g. "E6")

Module "ResourcePlan"

contains the functions for calculating the resource usage

Sub Main
- for each resource in sheet "Resources"
    - for each task with that resource
        - for each time slot in "resources"
            - add effort (relative or absolute)

Sub Init()
- initialize document
- initialize resource sheet and table
- initialize progress bar
- initialize task table

Function GetResourceEffort(oSheet, Col&, RelCol&, Row&) as double
- gets the value of (Col, Row) in oSheet or the percentage to RelCol

Sub Done()
- hide progress bar
- close usage of document

Module "ProgressBarDlg

contains the progress bar dialog window

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