

LICEF

MotPlus Software Editor

Object-Oriented Modelling Tool

User's Guide

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Introduction

MotPlus is a graphical editing tool enabling users to model different fields of knowledge and to build four different types of graphical models : **Standard, Flowchart, Educational** and **Ontology**.

Standard

MotPlus **Standard** are object-oriented modeling tools intended to express various fields of knowledge as graphic knowledge models. These models attempt to give a dynamic view on a particular field that is often vast and complex, and on the existing links between knowledge objects.

Flowchart

MotPlus **Flowchart** is the perfect tool for creating all kinds of business diagrams, from flowcharts and org charts to floor plans and technical diagrams.

Educational IMS Learning Design

The **Educational** IMS Learning Design specification supports the use of a wide range of pedagogies in online learning. Rather than attempting to capture the specifics of many pedagogies, it does this by providing a generic and flexible language. This language is designed to enable many different pedagogies to be expressed. The approach has the advantage over alternatives in that only one set of learning design and runtime tools then need to be implemented in order to support the desired wide range of pedagogies.

Ontology OWL

The OWL Web **Ontology** Language is designed for use by applications that need to process the content of information instead of just presenting information to humans. OWL facilitates greater machine interpretability of Web content than that supported by XML by providing additional vocabulary along with a formal semantics. OWL has three increasingly-expressive sublanguages: OWL Lite, OWL DL, and OWL Full.

Types of knowledge

Findings in the field of cognitive science indicate that there are various types of knowledge and certain links joining these as well as certain rules governing their inter-relationships. MotPlus works with these concepts. The software includes a number of graphical icons (**Standard**) representing the different types of knowledge (Concrete: **Facts** ; Abstract: **Concepts** , **Procedures**, **Principles** and **Option**) and the different types of links (**Composition** , **Regulation** , **Specialisation** , **Precedence** , **Input or Product** , and **Instance**). Furthermore, it integrates a set of Grammar Rules governing the valid **types of links** that may join the **types of knowledge**.

Finally, MotPlus enables the user to build a multilevel visualisation of a knowledge domain, i.e. Lower Models associated to the Knowledge Units making up the various models in a given document. This is MotPlus's fundamental characteristic.

These features enable learning system designers and content experts to build different **types of graphical models** representing any given knowledge domain. The MotPlus Editor is particularly useful when engineering

learning systems require that a clear distinction be made between the types of models and the types of knowledge in order to choose the appropriate instructional and media processing options. For all these reasons, this software is very well suited to such fields as process reengineering or instructional strategy design.

MotPlus was developed by the LICEF Research centre in the course of creating the MISA Method for engineering learning systems. Therefore, the various concepts we have just discussed (types of models, knowledge and links, etc.) are described in the MISA document titled *Knowledge Modelling Technique* . We recommend that the user take the time to read this document before using MotPlus.

The MotPlus User's Guide is designed to get you started building models almost immediately. It begins with an example that will help to introduce you to the concept of models. Then a chapter on preliminary information is followed by three progressive chapters: Basic Functions, Enhancement Functions, Advanced Functions. The description of the basic functions enables you to produce your first models quickly while, in the other chapters, you will learn how to refine your layout and apply more advanced MotPlus functions.

What is a model?

To introduce the concept of models and the various expressions used in this Guide, we will give an example of a **Knowledge Model** .

There are many types of models . You may already be familiar with some of them such as taxonomies and decision trees. Actually, *Knowledge Modelling Technique* identifies 13 types of models. The one to use depends first on the domain to be modelled . For example, the classification of animal species does not require the same type of model as the selection of an income tax rate. The type of model also depends on its purpose . In a given domain, the type of model will vary according to the particular aspect to be represented.

Suppose the ultimate goal is to repair a defective stereo system. To do this, a specialist must perform a succession of tasks. Therefore, we would have the following information:

- Domain: Electronic.
- Purpose of the Modelling: Represent the tasks required for repairing a defective stereo system.
- Type of Model: To model these tasks a **Procedural Model** is needed.

The Main Standard Model could look something like this:

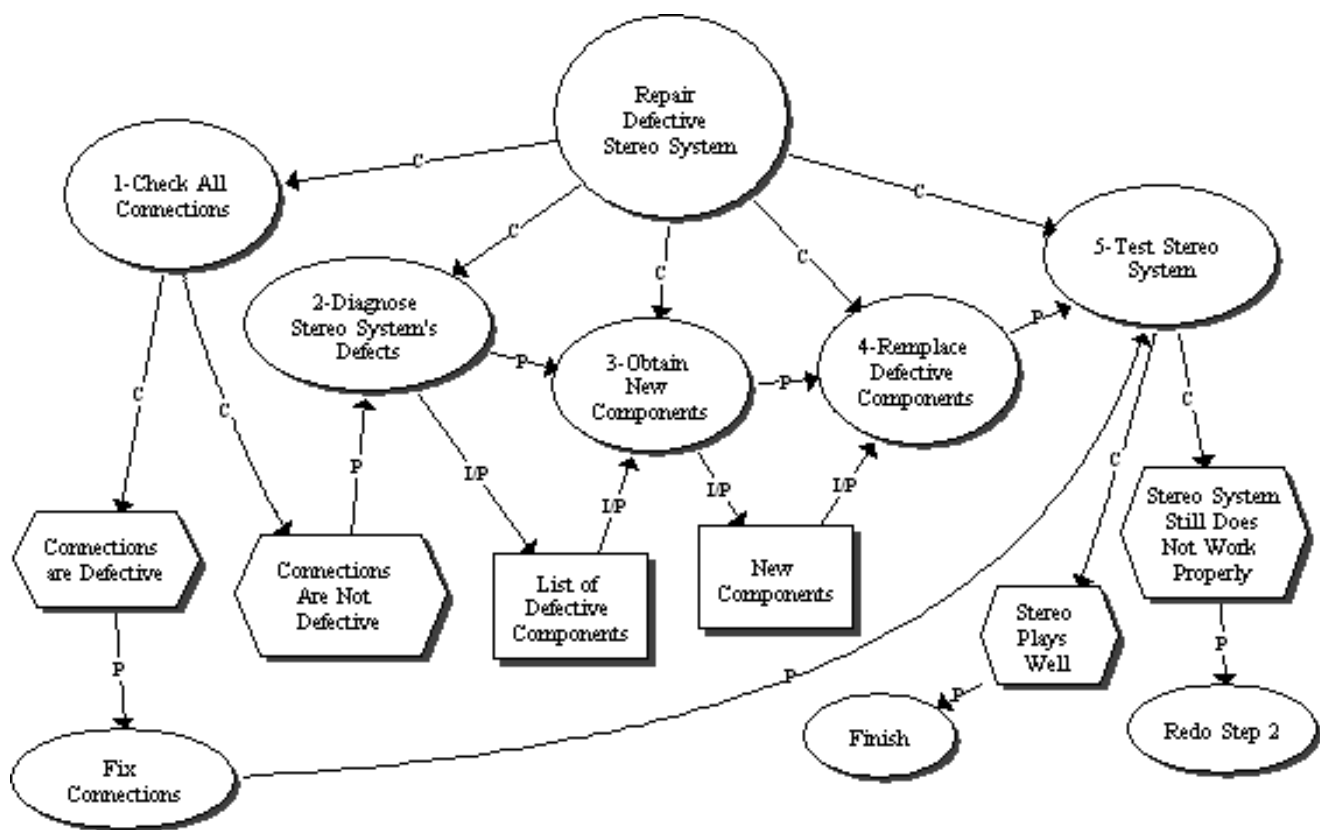



Figure 1 : Example of a Procedural Model

We will now briefly explain this model (which you may have already intuitively grasped) and describe some of the symbols used. The action 'Repair Defective Stereo System' is composed ('C' link) of several **Procedures** numbered 1 through 5 (oval objects) . Two of the Procedures (1 and 5) are composed of conditions or **Principles** (hexagonal objects) preceding ('P' link) each action. Principles followed by Procedures are interpreted as 'if...then...'. The three other Procedures (2, 3, and 4) produce (**Input or Product Link** : 'IP') in turn, two **Concept** objects (oblong figures) that are each necessary to the performance of a Procedure (Input or Product Link: 'I/P').

This level-1 model equates to the first step in designing a model. It consists in establishing an overall view of the subject to be modelled. This view is not encumbered with details that would make the model difficult to understand. However, in many cases, it is important to develop further a domain's Knowledge Model. The way to accomplish this is to build other models, i.e. level-2 models, associated to each of the Main Model's Knowledge Units that require more explanation. Procedure 2, 'Diagnose Stereo System's Defects', was developed into such an explanatory model.

The  symbol in MotPlus, appearing to the upper left of a Knowledge Unit, indicates the existence of an associated Lower Model.


The model associated to the 'Diagnose Stereo System's Defects' Procedure would look as follows:

Furthermore, a new link between two Concepts ('S' link) is illustrated in this model, since one Concept specialises the other, more general Concept.

For example: 'Clarity of Sound' is a sort of 'Attribute'.

Finally, 'if... then' conditions are found in this model. They take the form of Principles that make up a Procedure's prerequisites ('P' link) .

For example: The 'Value Differs from Standard' Principle is a prerequisite condition to the 'Add to List of Defective Components' Procedure.

As you can see by the  symbol, one of this model's Knowledge Units was developed into a level-3 Lower Model . It is the 'Process Control Structure' Principle governing ('R' link) the 'Diagnose Stereo System's Defects' task. Here again, developing the Principle into an associated Lower Model helps to simplify the level-2 Upper Model. Therefore, the Modelling of a domain of knowledge often entails nesting several Lower Models associated to specific Knowledge Units.

Let's see how the Lower Model associated to 'Control Process Structure' Knowledge Unit was developed.

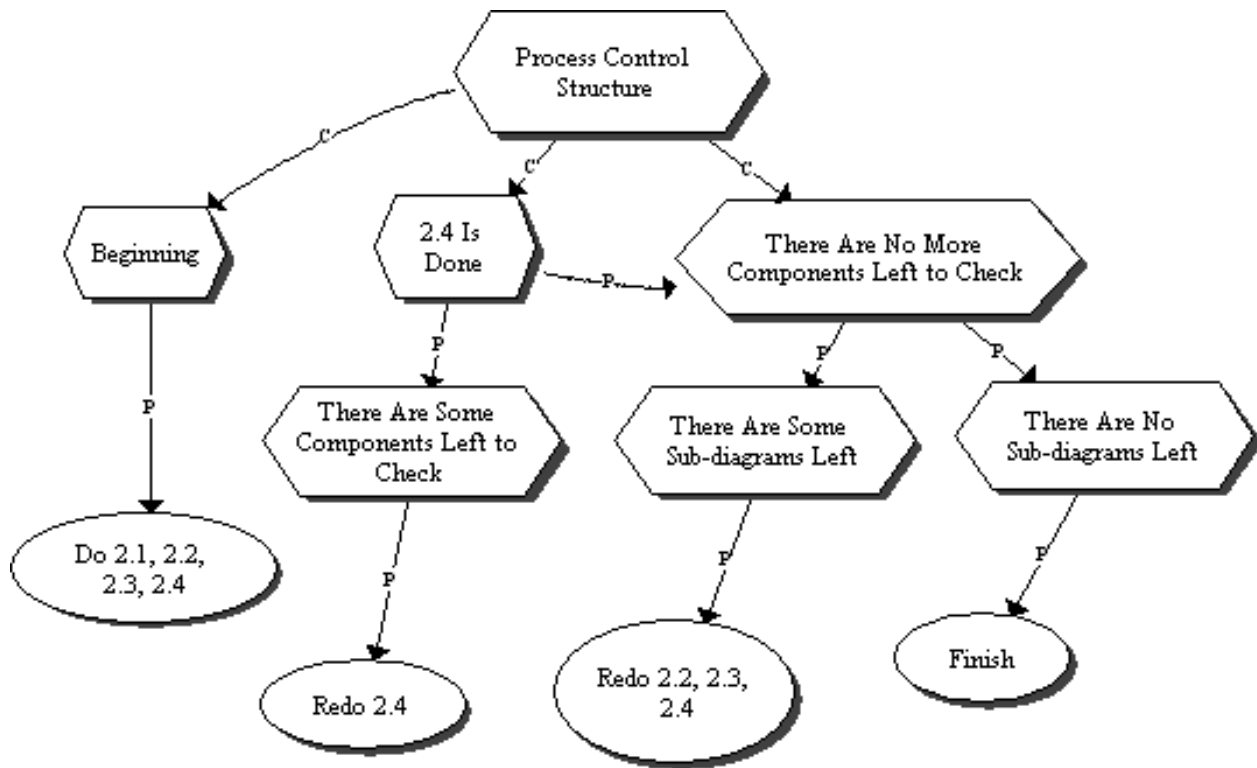


Figure 3 : Lower Model Associated to the 'Process Control...' Knowledge Unit

This model is fairly simple as it mainly represents a set of conditions governing the order of performance of the tasks. It is a **Control Structure Model** (one of the 13 types described in *Knowledge Modelling Technique*). The objective here is to illustrate the different conditions governing the order in which the sub-procedures of the 'Diagnose Stereo System's Defects' Knowledge Unit must be performed. In this model, each condition is expressed as follows: 'if... then...'.

In our example, the control structure (level-3 model) affects the performance of procedures related to the diagnosis (level-2 model), and the results of the diagnosis affect the performance of the Main Model's (level-1 model) procedures. The Main Model and Knowledge Units' Lower Models are always nested and dependent on one another. MotPlus actually enables you to create such relationships.

Note that, in this Guide, we often refer to models in a MotPlus document. You must keep in mind that we are not talking about several independent models but one Main Model and a series of nested models stemming from the Main Model.

The purpose of the above-mentioned example is to illustrate, at the very outset, a typical model you could produce using MotPlus. It answers the question "What is a model?". However, to fully benefit from all this software's outstanding features, it is also necessary to learn how to build a model. MISA's **Knowledge Modelling Technique** is specifically adapted to the needs of learning system designers. It suggests an approach for identifying and organising Knowledge Units and their Links in a concept map useful for engineering learning systems. However, by applying the basics on types of knowledge, links and models defined by this technique, it is possible with MotPlus to build simple or complex Knowledge Models that organise into a consistent whole, the Knowledge Units and Links of the various domains to be Modelled.

Drawn from **Knowledge Modelling Technique**, here is a summarised list of the steps to modelling a knowledge domain:

- Select a domain and define the purpose of the Modelling (in our example: the task of repairing a defective stereo system).
- Select the type of model (in our example: a Procedural Model).
- Select the Principal Knowledge Unit based on that purpose (in **Figure 1**, it is the 'Repair Defective Stereo System' Procedure).

Integrate other Knowledge Units and Links with the Principal Knowledge Unit based on the type of model selected (in **Figure 1**, these are the sub-procedures 1 through 5 related to the Principal Knowledge Unit using C links).

- Complete the Main Model (**Figure 1**).
- Develop the Main Model over several levels (**Figure 2** and **Figure 3**).
- Adjust, validate, etc.

Keep in mind that MotPlus is a tool. It is no substitute for your skill as a model designer, however, it will help you to be more efficient when building knowledge models tailored to your needs.

Learning Systems designe Method develop at the Télé-université's LICEF Research Centre.

1. Preliminary Information

- [1.1 How to Implement MotPlus](#)
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- [1.3 Basic Screen Display Features](#)
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1. Preliminary Information

Under Construction

This chapter discusses MotPlus installation procedure and its principal work window components.

1.1 How to Implement MotPlus

The following are the minimum system requirements for running MotPlus:

- Pentium 4 processor or better.
- Microsoft® Windows® XP.
- 512MB of RAM.
- At least 8 MB of available hard disk space.
- Color monitor with 640x480 resolutions.
- Mouse (Microsoft® compatible).

For more information on minimum configuration requirements, consult Windows® documentation.

1.1.1 Installing MotPlus

The MotPlus Application is provided on Internet. Here is the installation procedure for the application and related files.

Click on the URL : <http://www.liceftelug.quebec.ca/eng/index.htm>

Any supplemental trial (more than 30 days) needs a registration number. To request an access, please use « Download » above and answer the questionnaire in order to specify your specific needs.

1.1.2 Opening or Closing the Application

Open or close MotPlus just as you would any other Windows® XP application.

1.2 Description of the MotPlus Work Window

Once it is opened, MotPlus displays a work window where you will create and edit your models. This section describes the main features of this window to help you locate more easily each menu, button or graphic object when you finally get to work with your new tool.

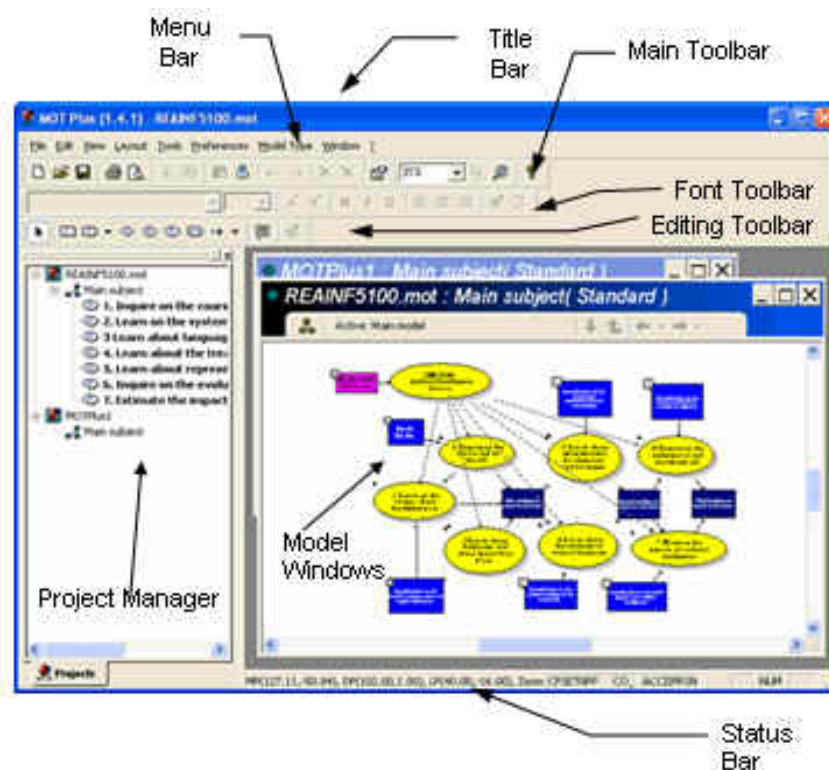


Figure 1 : Work Window

Title Bar

The MotPlus window's Title Bar indicates the name of the software, its version number followed by the name of the file that is currently opened. The default name any new file is [MotPlus 1]. The Title Bar of each of the model windows indicates the name of the file it displays.

The  icon (on the left) and the , ,  or  buttons (on the right) fulfil the standard functions of any other Windows® XP application.

Menu Bar

The Menu Bar gives access to a series of drop-down menus containing MotPlus' principal commands.

Toolbars

MotPlus has nine types of toolbars:

- **Main Toolbar** : This toolbar provides quick access to a series of frequently used commands. Many of these commands are the same as those you find in most Windows® 2000 or XP applications.
- *This toolbar can be activated or deactivated by toggling the **Main Toolbar** command on the **View Toolbars** submenu.*
- **Font Toolbar** : This toolbar provides quick access to a series of editing commands relating to the font of the text in the graphic objects.
- *This toolbar can be activated or deactivated by toggling the **Font Toolbar** command on the **View Toolbars** submenu.*
- **Standard Toolbar** : This toolbar provides quick access to a series of commands enabling you to create and edit the graphic standard objects.
- *This toolbar can be activated or deactivated by clicking on the **View Toolbars** submenu.*
- **Flowchart Toolbar** : This toolbar provides quick access to a series of commands enabling you to create and edit the graphic flowchart objects.
- *This toolbar can be activated or deactivated by clicking on the **View Toolbars** submenu.*
- **Educational Toolbar** : This toolbar provides quick access to a series of commands enabling you to create and edit the graphic Educational objects.
- *This toolbar can be activated or deactivated by clicking on the **View Toolbars** submenu.*
- **Ontology Toolbar** : This toolbar provides quick access to a series of commands enabling you to create and edit the graphic Ontology objects.
- *This toolbar can be activated or deactivated by clicking on the **View Toolbars** submenu.*
- **Labels Toolbar** : This toolbar provides quick access to a series of commands enabling you to create and edit the Labels.
- *This toolbar can be activated or deactivated by clicking on the **View Toolbars** submenu.*
- **Variants Toolbar** : This toolbar provides quick access to a series of commands enabling you to create and edit the Variants.
- *This toolbar can be activated or deactivated by clicking on the **View Toolbars** submenu.*
- **Layers Toolbar** : This toolbar provides quick access to a series of commands enabling you to create and edit the Layers.
- *This toolbar can be activated or deactivated by clicking on the **View Toolbars** submenu.*

Status Bar

When the mouse points to a button or menu command, a short description of the button's or command's function appears on the left side of the Status Bar.

The last three boxes on the bar indicate-from left to right-whether or not the Caps Lock, Num Lock and Scroll Lock keyboard commands are activated.

*This toolbar can also be activated or deactivated by toggling the **Status Bar** command on the **View Toolbars** submenu.*

Model Window Display Zone

The Model Window Display Zone is the part of the screen where the model windows of the open MotPlus documents are displayed.

The arrangement and sizing of these windows is managed using the Window menu or the .

 buttons located in the upper right corner of each window.

These buttons follow Window® standards.



Projects Manager

The Projects Manager displays a list of the currently active projects, including the names of the levels Knowledge Model.


1.3 Basic Screen Display Features

This section explains how to manage screen display of the whole model or parts of it.


1.3.1 Optimising the Display of the Whole Model

To display all of a model's objects in the window while optimise its sizing in the available space, click on **Full Screen Selection**  button or **Full Screen Model**  on the **Main Toolbar**.

1.3.2 Optimizing the Display of Part of a Model

To optimize the display in the available space of the objects in a selected zone, double-click on the  button on the Main Toolbar.


Adjusting the Model Display

You can also change the display sizing by using **Zoom** on the **View** menu; *or* the magnification percentage edit box  on the Main Toolbar

1.3.3 Creating and Editing a Document


This section explains how to manage MotPlus documents.

1.3.3.1 Creating a New Project

To create a model in a new project, click on the  button on the Main Toolbar *or* click on **New Project** on the **File** menu.

Upon opening, MotPlus' model window displays a blank document titled MotPlus1. You can get right to work building your new model.

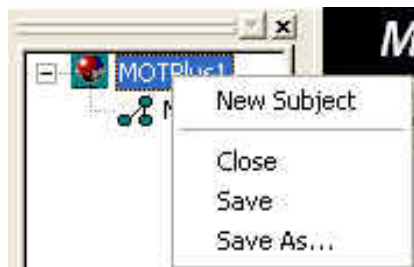
1.3.3.2 Opening an Existing Project

To open an existing document, click on the  button on the Main Toolbar *or* click on **Open** on the **File** menu.

This command opens a Windows® **Open** dialog box where you can locate and open the document using its file name.

1.4 Closing a Project

To close a project, select a project in the **Project Manager**. While pressing on the left mouse button and select the **Close** option.




1.5 Saving a Document

To store your document in a folder (directory) under an appropriate name, click on one of the save commands (**Save** or **Save As**) following Windows® standards.

1.6 Printing a Document

MotPlus provides many printing options. If necessary, you can print the active document as a whole (all its models), or just the displayed model, or those selected in the list of document models. You can also automatically optimise the sizing of each model to fit into a single print page, or spread a model over a grid where each box is the equivalent of a print page.

- To select the print parameters and start printing, click on the  button on the **Main Toolbar** *or* click on **Print** on the **File** menu. The system opens the **Print** dialog box.

Most of the print parameters in this dialog box follow Windows® standards. However, the parameters described below are specific to MotPlus.

Print Range

- **Complete Subject** : All of the models in the active document are printed.
- **Current Subject** : Only the model that is currently displayed is printed.
- **Models Type** : Only the type models selected in the model list are printed.
(Standard, Flowchart, Educational or Ontology)
- **Current Selection** : Only the active model's selected objects are printed
- **Models ...** : Only the models selected in the model list box are printed.

menu.

[2. Basic Functions \(Standard\)](#)

- [2.1 Choose the Type of Model \(Standard\)](#)
- [2.2 Creating and Editing Graphic Objects \(Standard\)](#)
- [2.3 Creating Link \(Standard\)](#)
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2. Basic Functions (Standard)

Under Construction

This chapter explains MotPlus basic functions that you will use to create Standard Knowledge Models. These functions will help you to start Modelling with MotPlus as quickly as possible.

Advice is given on various valid actions to be performed with relation to the graphic objects (create, select, move).

Before reading this chapter, we recommend users to familiarise themselves with the terms described in the Section [Description of the MotPlus Work Window](#).

*Upon opening, MotPlus' model window displays a blank document titled **MotPlus1** where you can get right to work.*

2.1 Choose the Type of Model (Standard)

We must stress that choosing the type of model is a way to begin Modelling by adopting, at the very outset, a specific point of view on the concept being studied. This choice is important, since it determines the type of the Principal Knowledge Units and their Links.

The model's type is selected among the list described in *Knowledge Modelling Technique*. There are thirteen types of models. These are summarised in the following Table :

Type	Sub-type	Principal Knowledge Unit	Principal Links	Examples
	Factual System	Facts	I	Chronology of historical events Multiplication table
Conceptual System	Taxonomy	Concepts	S	Taxonomy of the animal kingdom

	System with Components	Concepts	C	Automobile with its sub-systems and components
	Hybrid Conceptual System	Concepts + Definitions + Procedural Attachments	S, C, R, I/P	Geometry, physics and economics definitions
	Serial Procedure	Procedures	P	Agenda of a meeting
Procedural System	Parallel Procedures	Procedures	P, C	Sports tournament with ranking by total of points
	Iterative Procedure	Procedures, Action Principles, Input and Product Concepts	P, I/P, C	Thermostat feedback loop
	Laws and Theories	Relational Principles	R, C, P	Relationship between symptoms and sickness
Prescriptive System	Decision Tree	Action Principles	P, C	Selection of a financial vehicle
	Control Structure	Action Principles	R, C, P	Project management principles
	Process	Algorithm Procedure, Concepts, and Action Principles	C, I/P, R	Diagnosis of a mechanical problem
Process/ Method	Method and Technique	Heuristic Procedure, Concepts, and Action Principles	C, I/P, R	Architectural design of a building Project planning
	Multi-agent Process	Procedure, Concepts and Principles (agents)	C, I/P, R	Writing a text as a team Budget planning in an organisation

2.2 Creating and Editing Graphic Objects (Standard)

As described in the Introduction, MotPlus helps users to create graphic objects representing the five types of knowledge (**Concepts**, **Procedures**, **Principles**, **Option** and **Facts**) defined in *Knowledge Modelling Technique*. MotPlus even allows you to insert **Undefined Knowledge Units** that do not fit into any of the

regular categories. According to *Knowledge Modelling Technique*, this type can be associated to an object, such as a Skill, Learning Unit or Instrument, that links the current model to another knowledge domain through its associated Lower Model.









In MotPlus, the various types of knowledge can be joined using six types of links (**Composition, Regulation, Specialisation, Precedence, Input or Product** and **Instance**) according to the principles described in *Knowledge Modelling Technique*. There can be single (C) or multiple (C*) Composition Links between two Knowledge Units. When there are multiple links, Knowledge Unit A is composed of many examples of Knowledge Unit B rather than just one. The Multiple Composition Link is identified by the 'C*' tag.

MotPlus has an extra **Undefined Link (Yes or No)** to which you can give whatever name suits your purpose. For example, this Link can join a Skill to its related Knowledge Units.

In MotPlus, all these elements are considered graphic objects and any Modelling process must necessarily begin with learning the basic valid actions that may be performed on or with these graphic objects. We will now describe in detail the valid actions that may be performed in MotPlus.

2.2.1 Creating Graphic Objects (Standard)


Building a Knowledge Model essentially consists in creating, naming and linking various types of knowledge units in order to represent the user's perception of a specific domain of knowledge. One of the main actions is therefore to create the graphic objects (Knowledge Units and Links) required to illustrate the user's perception. If necessary, you can add Comments to your models. To create a graphic object, you proceed as follows:

- On the Editing Toolbar, click on the button showing the desired type of object among the following:
Concept ; **Procedure** ; **Principle** ; **Option** ; **Fact** ; **Undefined** ; **Link** ;
Comment .
- To create Concept, Procedure, Principle, Option, Fact, or Undefined objects, position the cursor in the model window wherever you wish to create the object. While pressing on the left mouse button, move the cursor until the object is the desired size. Release the mouse button. The object is in text editing mode. If applicable, enter the name of the new object. By right clicking on the Fact button in the toolbar, you will open a menu listing the various types of facts you can create. Click on the desired type of fact.




A check mark appears on the menu beside the type of fact that will be created.


- **Example** : to create a Factual Knowledge Unit related to a Concept.

The lower right corner of Examples carries a  tag.

- **Trace** : to create a Factual Knowledge Unit related to a Procedure.

The lower right corner of Traces carries a  tag.

- **Statement** : to create a Factual Knowledge Unit related to a Principle.

The lower right corner of Traces carries a  tag.

- **To create a Comment** related to the model, Knowledge Unit or Knowledge Unit Link.


If, at the outset, the mouse cursor is pointing to the model background, the Comment will relate to the model as a whole. While holding down the left mouse button, move the mouse to form a box big enough to hold your Comment. Release the mouse button. You can then enter your Comment text. When the Comment is selected, an arrow's head faces the centre right handle (when pointing to the arrow handle with the mouse, the cursor changes into crossed double arrows). If necessary, you can associate this Comment to a Knowledge Unit or Link by dragging the arrow's head to the related Knowledge Unit or Link.

If, at the outset, the mouse is pointing to a Knowledge Unit or Link, the new Comment will be directly related to that Knowledge Unit or Link. While holding down the left mouse button, move the mouse and release the button wherever you wish to insert your Comment. A box appears related to the Knowledge Unit or Link where you may enter your Comment text. If necessary, the Comment can be linked to another Knowledge Unit, Knowledge Unit Link or the Knowledge Model itself by dragging the arrow's link.


2.3 Creating Link (Standard)

From Links : to create a Factual Knowledge Unit unrelated to any Knowledge Unit. Its nature will be defined by the type of Knowledge Unit to which it is eventually linked.

The lower right corner of such a type of fact has no tag.

- **To create another object of the same type**, repeat the preceding step. The same button remains selected until you click on another command, so you can keep creating more objects of the same type.
- **To create a link between two Knowledge Units**, click on the  button and select one of the two following procedures.
In the model window, click on the source Knowledge Unit and drag and drop the link head on the destination Knowledge Unit.

The system then creates the type of link selected in accordance with the integrated (knowledge relationship) Grammar Rules. If valid, the Composition Link is chosen by default.

- By right clicking on the  button in the toolbar, you will open a menu listing the various types of links you can create. Click on the desired type of link and follow the previously explained procedure.



By default, a **Single Link** is created for **Composition Links**. If you select a **Multiple Composition Link**, it will be symbolised by 'C*' in the model.

If the Grammar Rules permit it, the system creates the selected type of link. If not, MotPlus automatically applies one of the links that are valid in the context.

A check mark appears on the menu beside the type of link that will be created.

2.3.1 Table of Grammar Rules (Standard)

The following Table summarises the valid Links between the various pairs of Knowledge Units.

Destination	Abstract Knowledge				Fact			
From	Concept	Procedure	Principle	Option	Fact	Exemple	Trace	Statement
Concept	C, C*, S, NT	IP, NT	NT	None	C,C*, I, NT	C, C*,I, NT	NT	NT
Procedure	IP, NT	C, C*, S, P, NT	C,C*, P, NT	P	C,C*, I, NT	NT	C, C*, I, NT	NT
Option	None	Yes, No, NT	None	NT	None	None	None	None
Principle	R, NT	C, C*, P, R, NT	C, C*, S, P, R, NT	None	C,C*, I, NT	NT	NT	C, C*, I, NT
Fact	NT	NT	NT	None	C,C*, R, NT	IP, NT	C,C*, P, NT	C,C*, P, NT
Exemple	NT	NT	NT	None	IP, NT	C, C*, NT	IP, NT	NT
Trace	NT	NT	NT	None	C, C*, P, NT	IP, NT	C, C*, P, NT	C, C*, P, NT
Statement	NT	NT	NT	None	C, C*, P, R, NT	R, NT	C, C*, P, R, NT	C, C*, P, R, NT

Refer to **Knowledge Modelling Technique** for more information about the Grammar Rules governing the linking of different types of knowledge units.

2.3.2 Grammar Rule Exceptions (Standard)

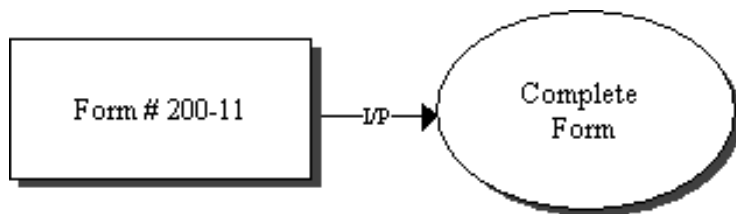
The Grammar Rules are defined in *Knowledge Modelling Technique*. However, MotPlus allows certain exceptions.

- When you create a Link that does not abide by the Grammar Rules and there are no other alternatives, MotPlus enables you to generate an Undefined Link.
- Upon creation, Undefined Links go immediately into Text Edit mode. You can then immediately identify your Link according to your needs.
- A Composition Link is always permitted between an Undefined Knowledge Unit and all other types of knowledge units.
- A Composition Link is permitted between a Concept and an Undefined Knowledge Unit.
- In the current version of MotPlus, the AP links mentioned in the Grammar Rules are represented by Undefined Links.

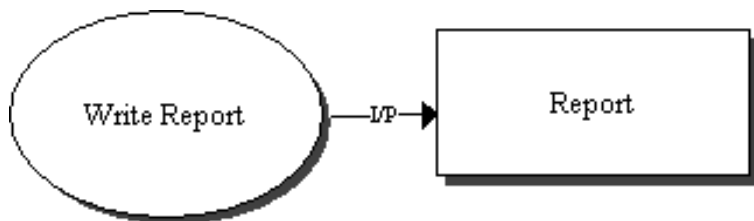
2.3.3 Suggestions on How to Use Knowledge Units and Links (Standard)

Here are some suggestions related to specific Modelling situations.

- **To illustrate an object used to perform a procedure**, join the **Concept** -type Knowledge Unit joined to the Procedure using an I/P link.

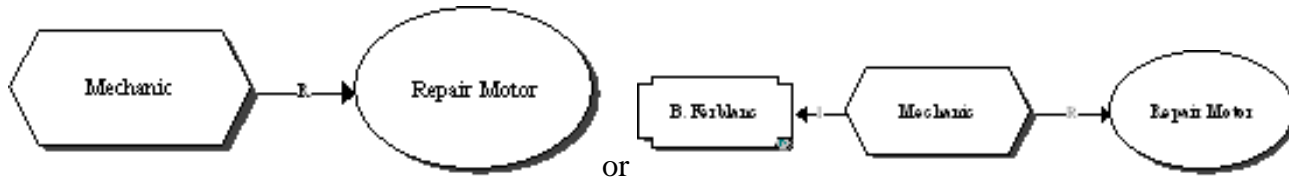


- **To illustrate an object produced by a procedure**, join the Procedure to the **Concept** -type Knowledge Unit using an I/P link.



- **To illustrate an actor or a person in charge of a procedure**, join the **Principle** -type Knowledge Unit to the Procedure using an R link.

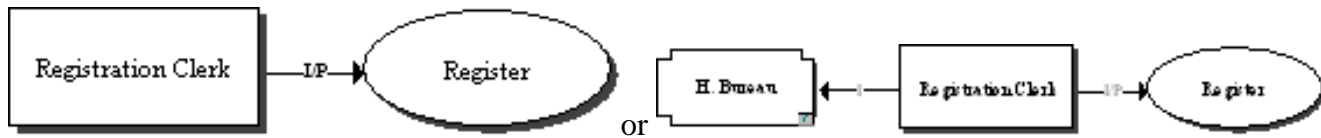
If appropriate, using an I link, join the Concept to a **Fact** -type Knowledge Unit indicating the name of the person.



In this example, the use of a Principle and an R link tells the reader that the actor or the person in charge affects or controls the Procedure.

- To illustrate a resource person, use a **Concept** -type Knowledge Unit.

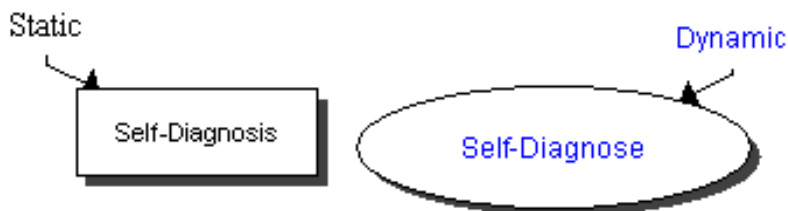
If appropriate, join the Concept using an I link to a **Fact** -type Knowledge Unit indicating the name of the person.



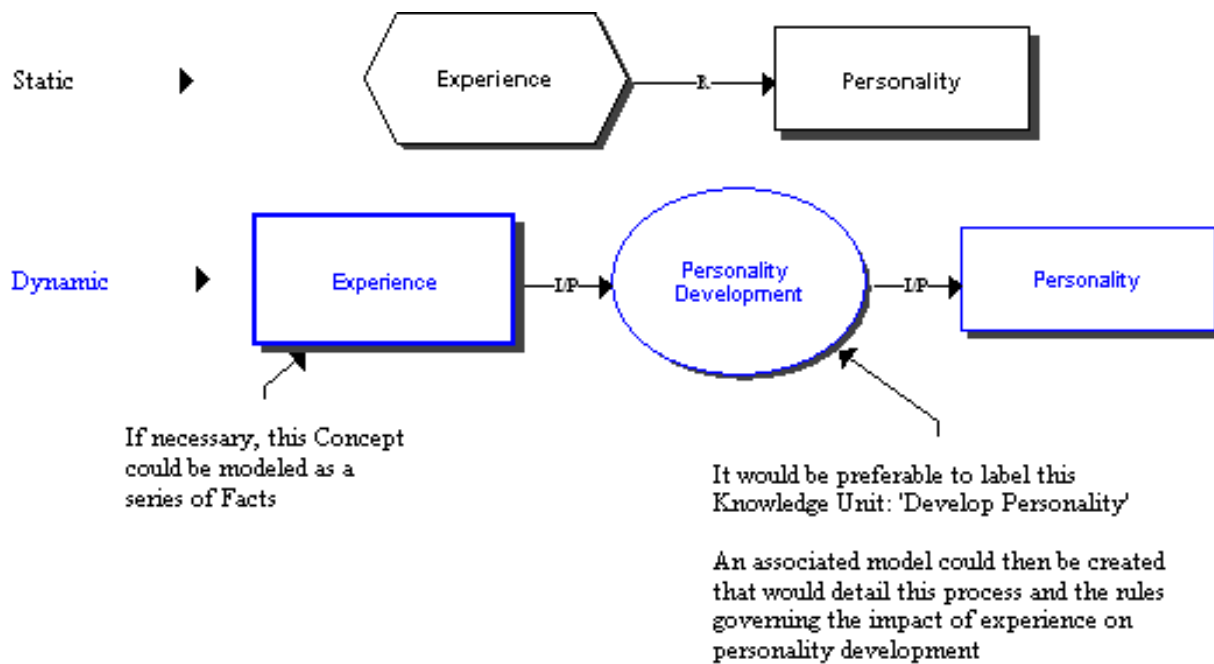
In this example, the use of a Concept and an I/P link tells the reader that the actor is a source of information useful to the Procedure.

- To illustrate the dynamics of a knowledge domain, use Procedures.

If at all possible, identify your procedures using a verb.



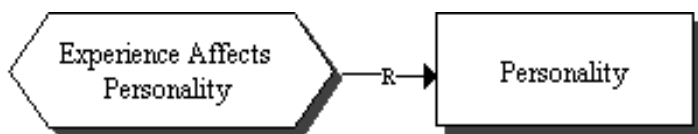
Or, as in the following example, use a term that defines a process.



In this example, the static model only enables the user to illustrate that experience has an impact on personality (i.e. it represents a set of knowledge establishing the causal link). It would seem more usual to consider experience as knowledge describing the nature of objects such as events, situations, and background. In the dynamic model, experience is represented by a Concept. The Procedure features a 'Personality Development' process, which can eventually be illustrated by a Lower Model describing the process and the rules governing the relative impact of experience.

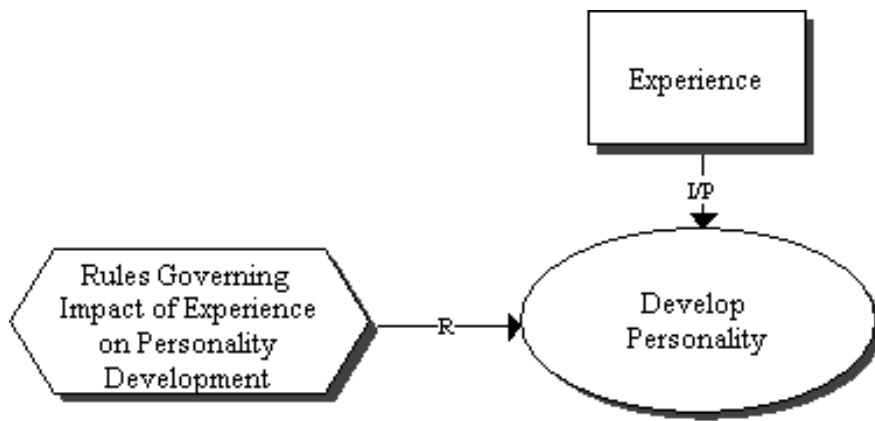
- **To illustrate Principle-Concept Relationships:**

According to the **Grammar Rules** defined in *Knowledge Modelling Technique*, the only direct Link permitted between these two types of knowledge units is a **Regulation Link** (R link). In the following example, the statement 'Experience Affects Personality' is illustrated using a Principle governing the Concept 'Personality'.



Otherwise, concept-principle relationships are usually illustrated using Procedures or Skills. Here are a few examples:

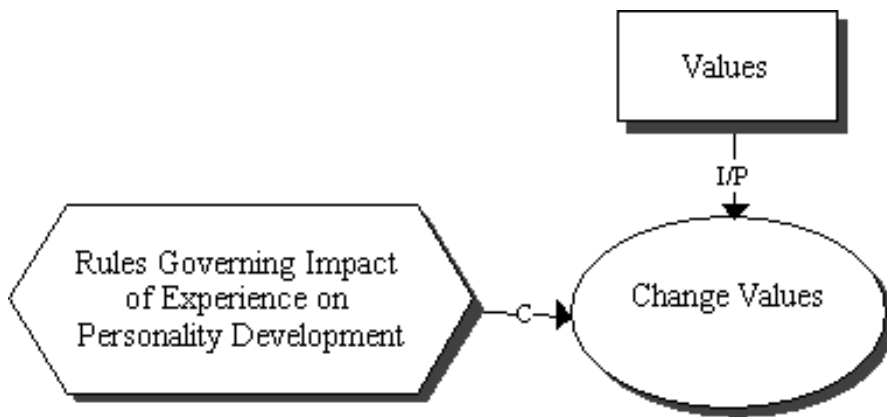
- In the following figure, the 'Experience' Concept related to the impact rules is illustrated as input into the 'Develop Personality' process governed by the Principle.



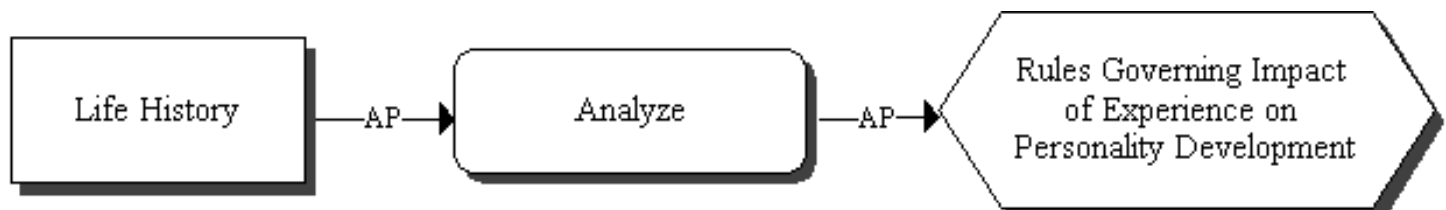
- In the following figure, the Concepts used to define the impact rules are input to the Procedure illustrating the action.



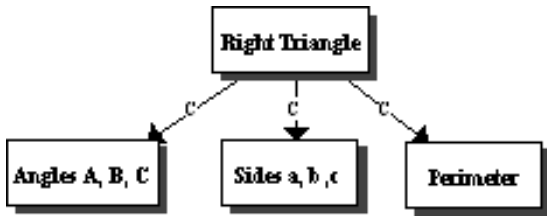
- In the following figure, the Concepts used by the impact rules are illustrated as input to the procedural component of the corresponding Principle.



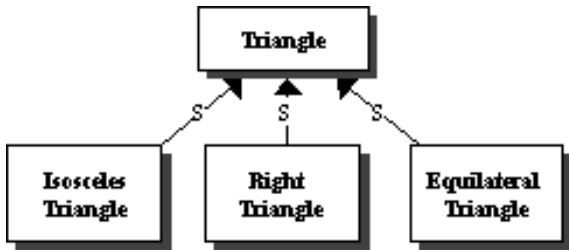
- In the following figure, the 'Life History' is processed by the 'Analyze' Skill to induce the rules governing the impact of experience on personality.



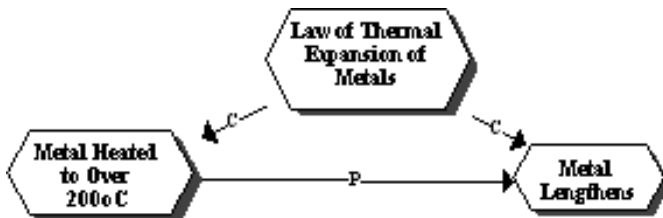
- To Illustrate a Knowledge Unit using its components, use C links from this Knowledge Unit to each of its component Knowledge Units.



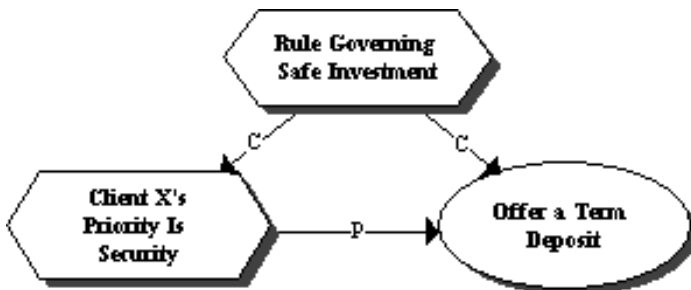
- To Illustrate a Knowledge Unit using its categories, use S links from the category Knowledge Units to the described Knowledge Unit.



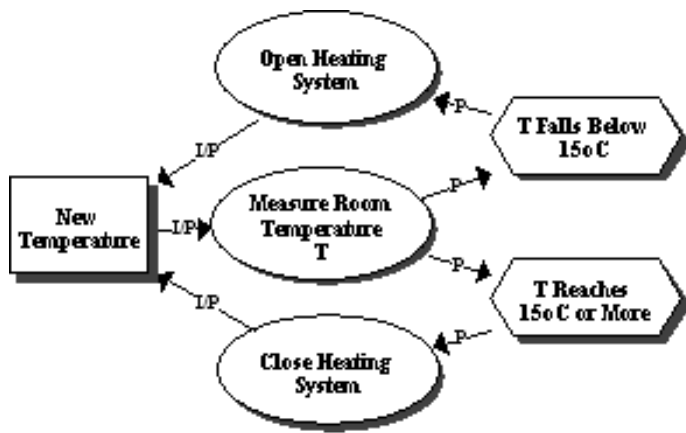
- To illustrate a relational Principle in an 'IF (condition). THEN (effect) ' format, use a **Principle** -type Knowledge Unit describing the **IF** condition joined by a P link to another **Principle** -type Knowledge Unit defining the **THEN** effect.



- To illustrate an action Principle in an 'IF (condition). THEN (action) ' format, use a **Principle** -type Knowledge Unit describing the **IF** condition joined by a P link to another **Principle** -type Knowledge Unit defining the **THEN** action.



- To illustrate an iterative procedure including one or more action loops, use decision Principles in the 'IF (condition). THEN (action) ' format.




- To view the valid Links between two types of knowledge units, create a Link between the two. Point to the selected Link and display the right click popup menu. Open the **Type** submenu (see **Changing the Type of an Existing Knowledge Unit or Link**): the system lists as active commands all the valid types of links between the two Knowledge Units. When needed, select one of the valid types of links.

*You can also consult the following Table before creating a Link and, then, choose the appropriate Link in the right click popup menu (see **Changing the Type of an Existing Knowledge Unit or Link**).*

It is then a question of replacing Undefined with AP.

2.4 Selecting Graphic Objects (Standard)

Selecting is a basic function of all actions involving graphic objects, including moving, copying, deleting, editing, and displaying the Lower Model This section describes how to select one or more graphic objects and how to resize the Knowledge Unit and Comment objects.

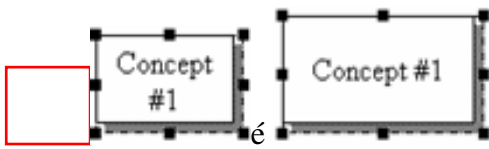
Clicking on the  button on the Editing Toolbar activates the Select command mode. It is automatically activated when you perform any equivalent action, e.g. clicking on an object on the model background.

- To select a graphic object, just click on the desired object.

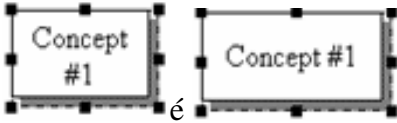
The selected graphic object (Knowledge Unit or Comment) is bordered by an 8-handled box.

To be able to drag a handle, the mouse must first be pointing to it. The pointer changes into a double-headed arrow according to the valid actions to perform for the selected handle.

The corner handles enable you to resize the selected object horizontally and/or vertically. Place the mouse pointer on one of these handles and hold down the mouse button to resize the object.



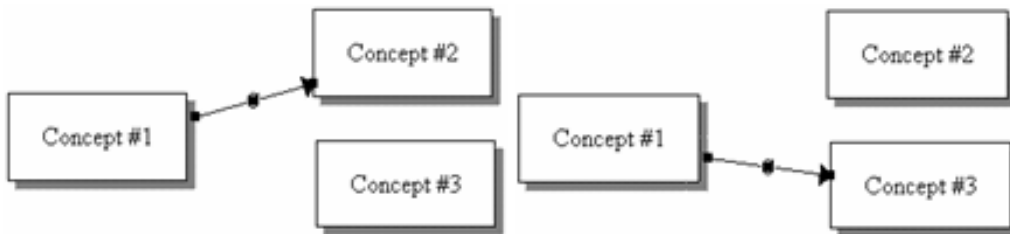
The side handles enable you to resize the selected object only horizontally or only vertically. Place the mouse pointer on one of these handles and hold down the mouse button to resize the object.



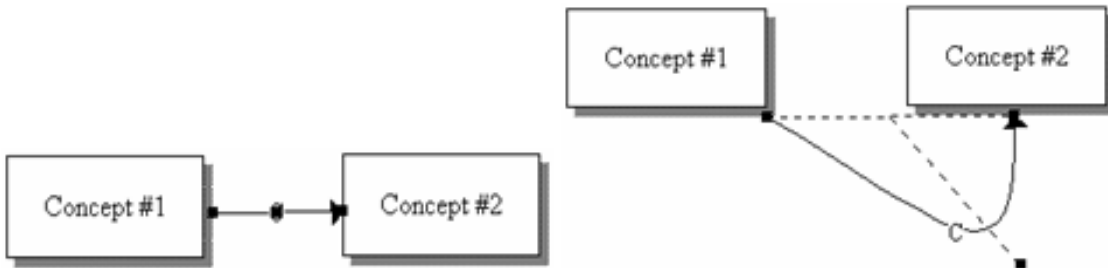
You know a Link is selected when you can see its handles.

To be able to drag a handle, the mouse must first be pointing to it. The pointer takes the shape of crossed double arrows indicating that you can move in any direction.

Using the handles at either end, you can move a Link from one Knowledge Unit to another. Place the mouse pointer on one of the handles and drag and drop it onto the appropriate position.



The centre handle enables you to change the link's curve to suit your needs in terms of graphical layout.



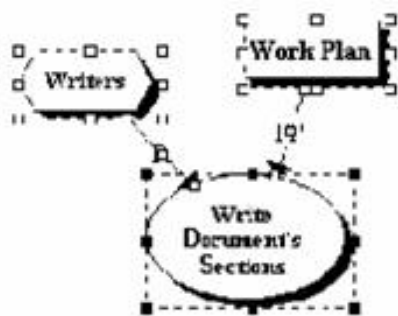
. **To select a group of graphic objects**, point to the model window background and, while pressing the left mouse button move the mouse drawing a box encompassing all the objects to be selected. Release the mouse button.

If it is not possible to include the desired objects in an box, press and hold the CTRL or SHIFT key and click on each graphic object to be included or excluded in the selection.

All the selected graphic objects are identified by their visible handles.

*In a group selection, there is always by default one **dominant** selection. In the following example, the three*

Knowledge Units are selected. The dominant Knowledge Unit, the one that will serve as a template for many commands, is identified by its dark handles, while those of the other two Knowledge Units are white. Note that in a group selection, it is always possible to change dominant selection by clicking on another object.



*Certain commands (ex. box **Attributes** commands) will affect all the selected Knowledge Units, others (ex. **Go to Lower Model** or change **Type**) will only apply to the dominant Knowledge Unit (in our example: Write Document's Sections).*

*You can also select all the graphic objects in a model by clicking on **Select All** on the Edit menu or the right click popup menu shown when pointing to the model background.*

2.5 Moving Graphic Objects (Standard)

It is sometimes useful to distribute the various graphic objects in such a way as to illustrate the model more clearly. In this section, we will show you how to move one or more Knowledge Units or Comments, change the source and destination of a link or modify its curve.

- **To move one or more Knowledge Units or Comments**, select the desired object(s), point to the selection and drag and drop it onto the selected location.
- **To change the source or destination of a link**, select the link and drag and drop the appropriate handle onto the desired Knowledge Unit.

*To invert a link, go to the **Link** submenu of the right click popup menu shown when pointing to the Link, and click on **Invert**.*

*See also **Moved or Copied Link's Name Changes**.*

- **To change a Link's curve**, select a link and drag the centre handle until the link has the desired curve.

[3 Edit](#)

- [3.1 Copying/Pasting Graphic Objects](#)
- [3.2 Clearing Graphic Objects](#)
- [3.3 Destroying Graphic Objects](#)
- [3.4 Searching and Replacing Knowledge Unit and Comment Text](#)

3 Edit

Under Construction

This chapter explains MotPlus' basic functions that you will use to be performed with relation to the graphic objects (move, copy, paste, delete, remove, find, replace, etc.)

3.1 Copying/Pasting Graphic Objects

The **Copy** function places objects in the clipboard. You can then paste the clipboard content in a selected model in the same or a different document.



However, when a Knowledge Unit is pasted into several models in the same document, it is sometimes difficult to edit its text everywhere without worrying about forgetting any occurrences. To overcome this difficulty, MotPlus enables you to use the **Paste Reference** command (paste with their reference) the Knowledge Units in the clipboard. A red dot appears on the left side of the object indicating that this Knowledge Unit is referenced. All the cross-referenced copies of a Knowledge Unit are considered by MotPlus as one and the same object. Consequently, selecting this option ensures that any type or text changes made in the Referenced Knowledge Unit will be reflected in all its cross-referenced copies.

The procedure for copying/pasting with/without reference is as follows.

3.1.1 Copying/pasting Knowledge Units, Grouped Objects Without Reference

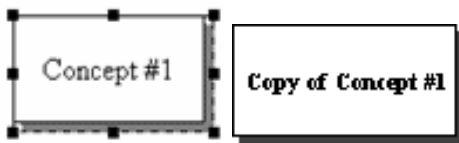
There are three ways to Copy/Paste graphic objects.

The first is to successively use the **Copy** and **Paste** buttons.

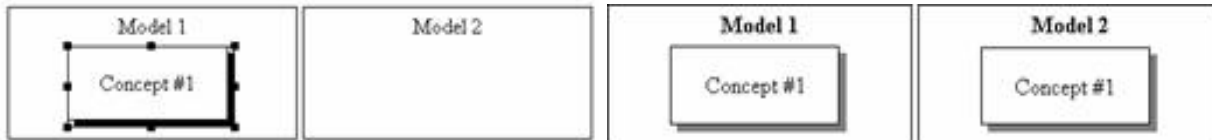
- Select the object(s) to copy.
- Click on the  button on the Main Toolbar or click on Copy on the Edit menu or the right click popup menu shown when pointing to the selected object.
- In the model chosen for copying (including the currently displayed model), click on the  button on the Main Toolbar or on Paste on the Edit menu.

Warning! *If you click on **Paste** when one or more objects in the destination model are selected, these will be deleted and replaced by the content on the clipboard.*

- Here is a second method for copying one or more objects into the same model:



- Select the object(s) to Copy/Paste.
- Hold the CTRL key down, point to the selection and drag it onto the model background.
- The next procedure also enables you to Copy/Paste one or more objects between two tiled model windows displaying different documents.



- Select the object(s) to Copy/Paste.
- Using the Open command on the File menu, retrieve the desired document. Click on Cascade or Tile in the Window menu to simultaneously display both documents.
- Activate the window containing the copy source Knowledge Model. While holding down the CTRL key, point to the selection and drag and drop it onto the destination window's model background.

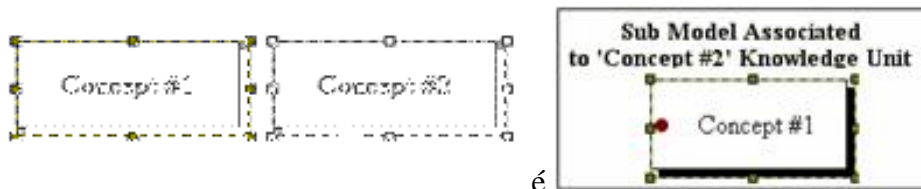
The Lower Models associated with the copied Knowledge Units are not included in the pasted version.

A pasted Knowledge Unit's OLE Link is also copied, meaning both a Knowledge Unit and an OLE Link are added to the destination document.

3.1.2 Copying/Pasting Knowledge Units with their Reference

There are three procedures you might use to Copy/Paste Knowledge Units with their reference.

- The following procedure enables you to paste one or more Knowledge Units directly into a Lower Model along with their reference to one of the Knowledge Units of the displayed model.




- Select the Knowledge Units to be pasted with reference or select a group of objects including the desired Knowledge Units.
- While holding down the CTRL key, point to the selection and drag and drop it onto the destination

MotPlus displays the Lower Model associated to the destination Knowledge Unit and pastes the initially selected Knowledge Units along with their reference. The other objects are simply pasted into the Upper Model.

- Activate the window containing the copy source Knowledge Model. While holding down the CTRL key, point to the selection and drag and drop it onto the destination window's model background.

3.1.3 Undoing One or More Commands


When certain commands do not produce the desired results or you change your mind in the course of developing your model, the following command enables you to undo one or more recently performed operations.

Click as many times as necessary (maximum of 32 times in the same model) on **Undo** on the **Edit** menu *or* the  button on the Main Toolbar. This command is inactive when there are no more or not yet any commands to undo.

***Undo** does not restore text changed with the **Replace** function.*

3.1.4 Redoing One or More Cancelled Commands


If you have undone too many commands or simply decide to restore what was cancelled, just follow this procedure.


Click as many times as necessary (maximum of 32 times in the same model) on **Redo** on the **Edit** menu *or* the  button on the Main Toolbar. This command cancels the effect of the **Undo** command. It is inactive when there are no more or not yet any commands to restore.

This command will be limited to the commands which you have just made in the selected model

3.2 Clearing Graphic Objects

The following procedure enables you to delete locally one or more graphic objects. The **Clear** command deletes the selected graphic objects, whether they are referenced or not, **only** in the displayed model.

- Select the desired object(s).
- Click on the  (black X) button on the Main Toolbar or click on Clear on the Edit menu or the right click popup menu shown when pointing to one of the selected objects.


*You can also delete selected object(s) from the model and place them in the clipboard by using **Cut** on the **Edit** menu *or* the right click popup menu shown when pointing to a selected object; *or* by clicking on the  button on the Main Toolbar. The Lower Model associated to the cut Knowledge Units will also be not transferred to the clipboard.*

The Links between two Referenced Knowledge Units will always be deleted in all the document's models.

If a Knowledge Unit selected for deletion is not referenced but has an associated Lower Model, a MotPlus dialog box opens. This dialog box requests confirmation that you really want to delete this Knowledge Unit as well as its associated Lower Model.

3.3 Destroying Graphic Objects

The following procedure enables you to destroy one or more graphic objects locally or throughout the document. **The Destroy** command deletes selected non-referenced Knowledge Units locally—same effect as **Clear**—but it deletes Referenced Knowledge Units throughout the **entire** document.

- Select the desired object(s).
- Click on the  (red X) button on the Main Toolbar or click on **Destroy** on the **Edit** menu or the right click popup menu shown when pointing to one of the selected objects.

If a Knowledge Unit selected for deletion has an associated Lower Model, a MotPlus dialog box opens. This dialog box requests confirmation that you really want to delete this Knowledge Unit as well as its associated Lower Model.

3.4 Searching and Replacing Knowledge Unit and Comment Text

In a complex document comprising multiple model levels, it could prove difficult to locate a character string, word or phrase used in one of the Knowledge Units or Comments. In addition, if these text elements are repeated in a number of Knowledge Units or Comments, it may be just as hard to find all occurrences without exception. However, MotPlus **Search** command makes this task easy. Should the goal of the search is to replace the character string, word or phrase being sought, then MotPlus **Replace** function is the one to select.

Both **Search** and **Replace** are in the **Edit** menu.

- The **Search** function enables you to locate the Knowledge Units and Comments that contain the text entered in the **Search** field in the **Search** dialog box. Based on the direction and other parameters defined, each time you click on the **Search Next** button, the system will go to the next Knowledge Unit or Comment containing the text entered.

If no Knowledge Unit or Comment contains the specified text, no result will show up on the screen. Check the accuracy of your request.

Description of the Search Dialog Box

- **Search** : Edit box for entering the text sought.
- **Match whole word only** :
 - **Blank** —looks for Knowledge Units or Comments containing the string entered in the Search what field (whether it is preceded with and/or followed by other characters or not).
 - **Checked** —looks for Knowledge Units or Comments containing whole words matching the text entered in the Find what field.
- **Match case**:
 - **Blank** —looks for a match to the text in the Search what field regardless of any uppercase or lowercase letters it may contain.
 - **Checked** —looks for an exact match to the text in the Search what field, taking into account any uppercase or lowercase letters it may contain.
- **Search Next** Button: Launches the search for the next Knowledge Unit or Comment containing matching text.
- **Cancel** Button: Closes the Find Dialog Box.

The **Replace** function enables you to search for Knowledge Units and Comments containing a match to the text in the **Find what** field and replace it with the entry in the **Replace with** field.

*Undo on the **Edit** menu or the  button on the Main Toolbar does not restore text changed using the **Replace** function.*

Description of the Replace Dialog Box

- **Search what** : Edit box for entering the text sought.
- **Replace with** : Edit box for entering the replacement text.
- **Match whole word only** : Searches for whole words and not parts of a longer word.
- **Match case** : Takes into account or disregards any uppercase letters in the search text.
- **Search Next** button: Launches the search for the next Knowledge Unit or Comment containing matching text.
- **Replace** button Replaces in the Knowledge Unit or Comment the text matching the Search what entry with the Replace with entry and automatically launches a search for the next occurrence.
- **Replace All** button: Replaces with the Replace with entry the text matching the Search what entry contained in all the document's Knowledge Units and Comments.
- **Cancel** button: Closes the Replace Dialog Box

[4 Knowledge Units](#)

- [4.1 Editing the Labels of Knowledge Units, Comments or Undefined Links](#)
- [4.2 Creating a Knowledge Unit's Lower Model, Changing Levels](#)

4 Knowledge Units

Under Construction

One of MotPlus unique features is multilevel Modelling, i.e. the definition of Lower Models associated to the Knowledge Units making up the various models in a given document. We will explain how to create associated Lower Models and navigate from level to level.

4.1 Editing the Labels of Knowledge Units, Comments or Undefined Links

When you create a Knowledge Unit, Comment or Undefined Link, MotPlus automatically goes into Edit Mode so you can identify the objects or enter pertinent text. However, we will now explain how to edit the label of existing graphic objects:

- Double-click with the left mouse button on the Knowledge Unit, Comment or Undefined Link you wish to edit. The label is automatically selected and ready to be deleted or replaced by whatever is entered on the keyboard. You can change part of the text, cut, copy, and paste some text using the commands on the right click popup menu or the **Edit Toolbar** or the **Edit** menu. These commands follow Windows® standards.

4.2 Creating a Knowledge Unit's Lower Model, Changing Levels


Sometimes the complexity of a particular domain of knowledge demands the inclusion of a great many Knowledge Units and Links in its model. In these cases, you may wish to clarify the representation of the domain by retaining only a main model's Knowledge Units while developing these further in Lower Models. This is one of MotPlus' fundamental features. Starting from the Main Model (level 1), you can build and display a Lower Model (level 2), if need be, for each of the Principal Knowledge Units in the Main Model. When the Knowledge Units of the Lower Model require detailing, you can build and display their own associated Lower Models (level 3), and so on. The models are nested like Russian dolls. This feature enables you to build a multilevel representation of the domain of knowledge.

*See the example shown in **Introduction**.*

*We recommend you follow the procedure explained in **Knowledge Modelling Technique** when modelling a*

domain of knowledge. The approach described therein suggests you start by designing an initial model then gradually add levels as you develop the model further.




In the model, Knowledge Units with associated Lower Models are identified by the  icon appearing in the upper left corner of the object.

In the drop down menu, Knowledge Units with associated Lower Models are identified by the  icon appearing to the left of their name.

MotPlus enables you to create as many levels as necessary and navigate from one document level to the other. To do this, you proceed as follows:

4.2.1 Creating/Viewing a Knowledge Unit's Associated Lower Model

For a Knowledge Unit without any associated Lower Model, the following procedure displays an empty model where you can build one. If the Knowledge Unit has an associated Lower Model, it will display it, thus enabling you to view or edit it according to your needs.

- In the displayed model, select the Knowledge Unit for which you wish to develop or view a Lower Model and *either* press ENTER *or* click on the  button on the Main Toolbar; *or* click on the **Go Down**  button on the **Model Window Toolbar**; *or* click on the **Step Forward**  button on the **Model Window Toolbar**.

4.2.2 Returning to the Upper Model (Parent Model)

The procedure for returning to the parent of a displayed Knowledge Unit's Lower Model is as follows.

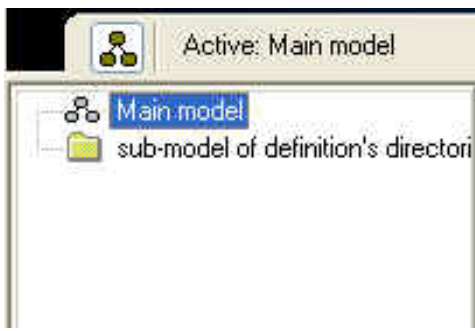
Click on the **Go Up**  button on the **Model Window Toolbar**; *or* click on the **Step Back**  button on the **Model Window Toolbar**

This command is inactive when the Main Model is displayed.

4.2.4 Returning to the Main Model

There are two ways to return to the Main Model.

- You can go directly to the Main Model by clicking 'Main Model' on the drop-down menu on the **Model Window Toolbar**.



- Since there can be many levels of models, you could also navigate from level to level by clicking as many times as necessary on the name of the upper model in the **Project Manager**.

[5. Graphic Attribute-Related Features](#)

- [5.1 Defining the Graphic Attributes of Objects to Be Created](#)
- [5.2 Changing the Graphic Attributes of Existing Objects](#)
- [5.3 Standardising Alignment, Spacing and Sizing of Graphic Objects](#)
- [5.4 Changing the Object Overlay Order](#)

5. Graphic Attribute-Related Features

Under Construction

This section describes some of MotPlus features related to defining the model's graphic attributes. You may wish to redesign your graphic objects in general or in particular, modifying their style, color or the thickness of their lines. You may seek to emphasize a specific element or just to make your model more attractive.

For the sake of clarity, it may be necessary to space objects that overlap, align Knowledge Units on the same level or select similar sizing for similar objects. MotPlus gives you ways to go about this.

5.1 Defining the Graphic Attributes of Objects to Be Created

- Point to the model's background.
- Click on Attributes on the Layout menu *or* Graphic Attributes in the right click popup menu.

The system opens the **Graphic Attributes** dialog box where the options in a set of tabs enable you to define the background's attributes as well as those of the arcs and boxes used to create graphic objects in the current document.

5.1.1 Description of the Graphic Attributes Dialog Box

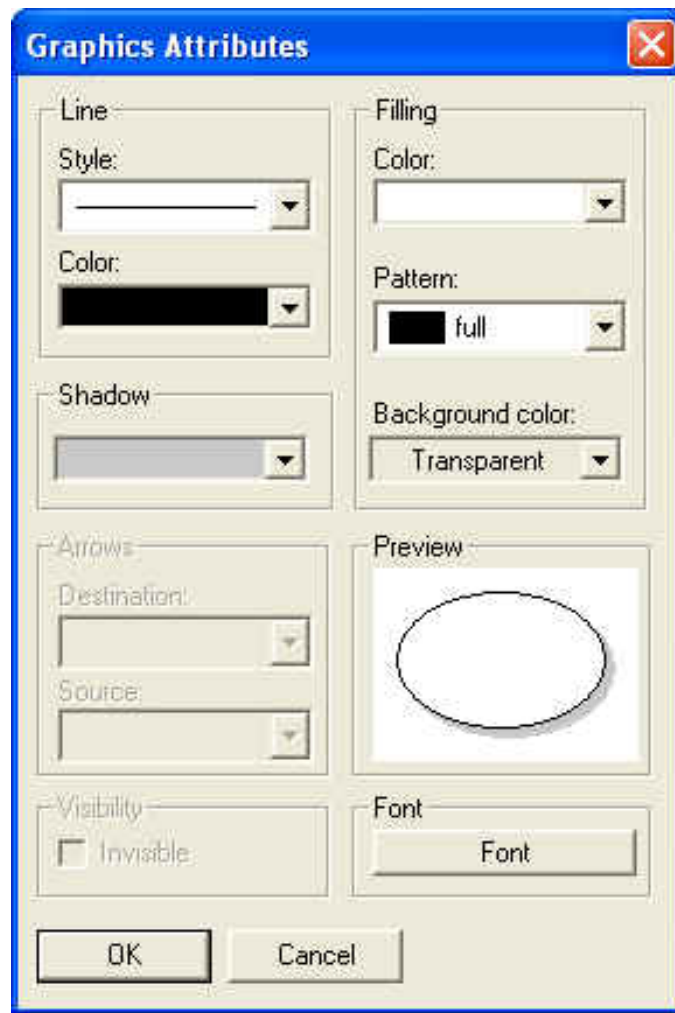


Figure 1 : Graphic Attributes Dialog Box (Boxes Tab)

- In the **Graphic Attributes** windows you can define the following attributes:
 - The **Style**, **Color** and **Shadow** of the border.
 - The **Pattern** as well as the color of the pattern itself and its background.
 - In the tab **Background**, you can define the color of the model's background and indicate whether or not this color should be used for printing.
 - You can also change the fill color after you draw the object.
 - The **Font** button opens a Windows® **Font** dialog box for defining text attributes.
 - You can indicate whether or not you wish to enhance your Knowledge Unit boxes with a shadow.
 - The style and color of the lines use to draw the Links.
 - The shape of the Links at their destination and source.
 - Whether or not the Links should be hidden.

A preview window shows the effect of your selections on the selected Links.

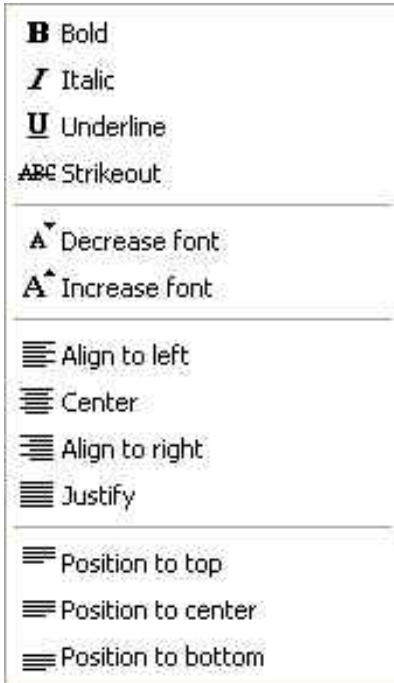
The background color defined in this dialogue box only applies to the displayed model.

5.1.2 Positioning the Text in an Object

The **Text** submenu on the **Layout** menu enables you to define the position of the Knowledge Unit or Comment

text within the existing or future object's area.

- To change the font, click on the appropriate command in the submenu.
- To left-, right- or center-justify the text, click on the appropriate command in the submenu.
- To position the text at the top, middle or bottom of the object, click on the appropriate submenu commands.
-






5.2 Changing the Graphic Attributes of Existing Objects

Select the desired object(s).

- Click on **Attributes** on the **Layout** menu or **Graphic Attributes** in the right click popup menu.

5.2.1 Copy Format Painter

- By clicking on the  button (Copy Format Painter) on the Editing Toolbar, you can give one or more selected objects the same attributes as a previously selected object. The mouse pointer then takes the shape of a little paintbrush.
- Select the object of which the attributes will be copied.
- Click on the  button.
- Point to the object to be changed and left click with the mouse or encompass a group of objects in a selection square by holding down the mouse button and release it to copy the attributes to all the selected objects.


By double clicking on the  button, you can copy attributes to a succession of objects or groups


of objects. The **Copy Format Painter** function remains active until you deactivate it by clicking on the background. It is also deactivated as soon as another command is selected.

The **Copy Format Painter** command can be used to copy attributes to one or more objects in another model of the same or a different MotPlus document.

5.2.2 Copy Object/Link

To change the type of graphic object :

- Select a object (procedure).
- Click on the button .
- Select a new object in the current document (Principle).

By double clicking on the button , you can copy the type of graphic object to a succession of objects or groups of objects.

5.3 Standardising Alignment, Spacing and Sizing of Graphic Objects

For the sake of clarity, it may be necessary to space objects that overlap, align Knowledge Units on the same level or select similar sizing for similar objects. To do this, you will proceed as follows.

You must first select more than one object to access the standardising commands described hereunder.

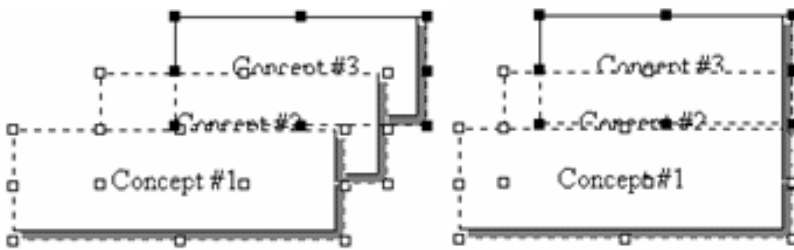
5.3.1 Aligning Selected Graphic Objects

- **Alignment** on the **Layout** menu enables you to align selected Knowledge Units, grouped objects and/or Comments relative to the dominant selection.

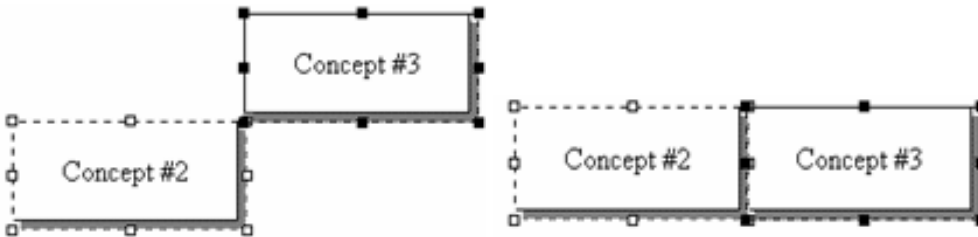
To change the dominant selection, just click on another object in the selected group.

When you point to this option, a submenu opens containing the following options:

- **Align to left sides** : Aligns the left sides of the selected Knowledge Units, grouped objects and Comments with the dominant selection's left side.
- **Align X centers**: Aligns the centers of the selected Knowledge Units, grouped objects and Comments with the dominant selection's center.
- **Align to right sides**: Aligns the right sides of the selected Knowledge Units, grouped objects and Comments with the dominant selection's right side. Here is an example.



- **Align tops:** Aligns the tops of the selected Knowledge Units, grouped objects and Comments with the dominant selection's top.
- **Align centers :** Aligns the middles of the selected Knowledge Units, grouped objects and Comments with the dominant selection's middle. Here is an example.



- **Align bottom :** Aligns the bottoms of the selected Knowledge Units, grouped objects and Comments with the dominant selection's bottom.

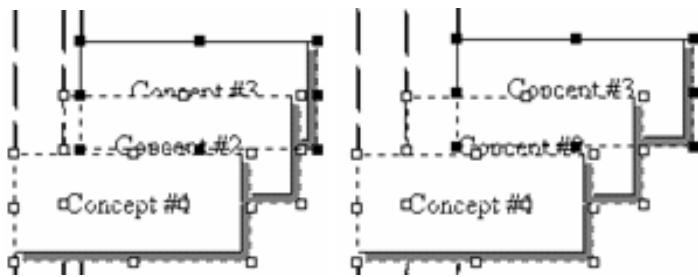
5.3.2 Description of the Arrange Dialog Box

The **Arrangement** command enables you to define the spacing and alignment of selected Knowledge Units, grouped objects and/or Comments based.



Arrange by left sides

The spacing of the left sides of all the selected objects is equal to the spacing of the left sides of the two leftmost objects in the selection. Here is an example.



Arrange by X center

The spacing of the centers of all the selected objects is equal to the spacing of the centers of the two left most objects in the selection.

Arrange by right sides

The spacing of the right sides of all the selected objects is equal to the spacing of the right sides of the two right most objects in the selection.

Arrange horizontal

The command enables you to define the spacing and alignment of selected Knowledge Units, grouped objects and/or Comments based on the horizontal axis and certain reference points.

Arrange by top sides

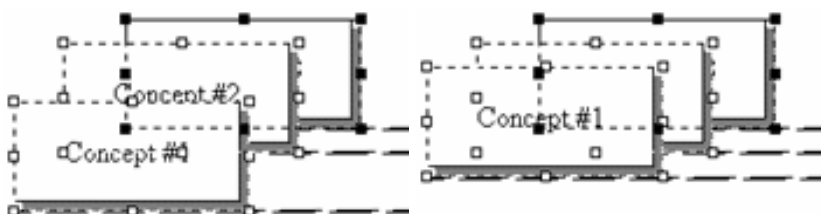
The spacing of the tops of all the selected objects is equal to the spacing of the tops of the two highest objects in the selection.

Arrange by Y centers

The spacing of the middles of all the selected objects is equal to the spacing of the middles of the two middles objects in the selection.

Arrange by bottom sides

The spacing of the bottoms of all the selected objects is equal to the spacing of the bottoms of the two bottoms objects in the selection. Here is an example.



Arrange vertically

The command enables you to define the spacing and alignment of selected Knowledge Units, grouped objects and/or Comments based on the vertical axis and certain reference points.

5.3.3 Equalising the Size of Selected Objects

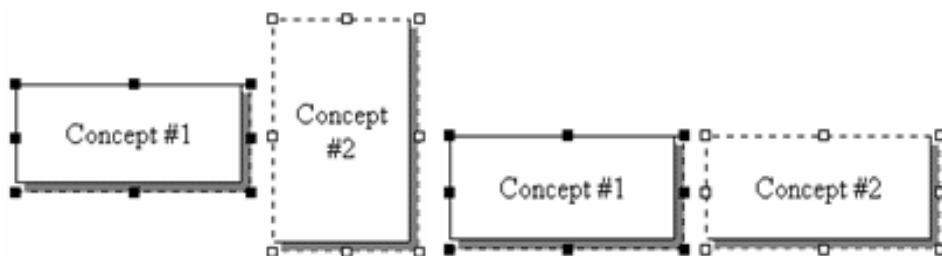
The **Equalization** command on the **Layout** menu enables you to define the horizontal and/or vertical sizing of graphic objects based on the dominant selection's dimensions.

To change the dominant selection, just click on another object in the selected group.

When you point to this option, a submenu opens containing the following options:

- **Horizontal** : Adjusts the width of the object.
- **Vertical** : Adjusts the height of the object.
- **Complete** : Adjusts both the width and the height of the object.

The figures here under illustrate the effect of the **Complete** option.



5.4 Changing the Object Overlay Order

The plane of each new object that is added to a model is layered on top of all the model's existing objects. In a complex model, object overlay has an impact on the model's interpretation and clarity. In this section, we will explain how you can move graphic object layers forward and back to suit your needs.

Move to Back on the **Position/Layout** menu places all the selected graphic objects behind all unselected objects. The selected objects will then appear underneath any other overlaid objects.

Move to Front on the **Position/Layout** menu places all the selected graphic objects in front of all unselected objects. The selected objects will then appear on top of the other objects they overlay.

[6. OLE Links](#)

- [6.1 Using OLE Links](#)
- [6.2 Viewing the Properties of Graphic Objects](#)
- [6.3 Creating a Knowledge Unit's Associated Lower Model](#)

6. OLE Links

Under Construction

This chapter describes how to use OLE links, and insert MotPlus documents into one another.

6.1 Using OLE Links

You may need to insert a document from another application into a MotPlus document. This section explains how this is done.

6.1.1 Attaching an OLE Document to a Model, Knowledge Unit or Comment

MotPlus provides the way to attach an OLE document. You can select the attachment in a list of applications supporting OLE.

To attach from a list of OLE capable applications, click on Insert Object on the Edit menu.

The action performed depends on the point of insertion defined by the mouse.

- When the mouse is pointing to the model background, the system creates a concept and inserts an OLE object representing the selected application document.
- When the mouse is pointing to a selected Knowledge Unit or Comment, the system inserts an OLE object representing the selected application document.

*Both **Attach OLE Document** and **Insert Object** open the Windows® **Insert Object** dialogue box where you can choose to create a new OLE object or create one from an existing file. If you create a new OLE object, the dialogue box lists the available OLE applications.*

6.1.2 Viewing, Editing and Detaching OLE Documents

- **To view/edit an OLE document**, double click on the OLE document's icon; *or* select the Knowledge Unit or Comment containing the OLE document and click on **Open OLE document** on the **View** menu *or* the **Knowledge** or **Comment** submenu of the right click popup menu shown when pointing to one or the other of these types of objects.

*The **View** menu command is unavailable when pointing to a grouped object.*


*To open an OLE document within a grouped object, point to the object containing the OLE and click on **Open OLE document** on the **Knowledge** or **Comment** submenu of the right click popup menu.*

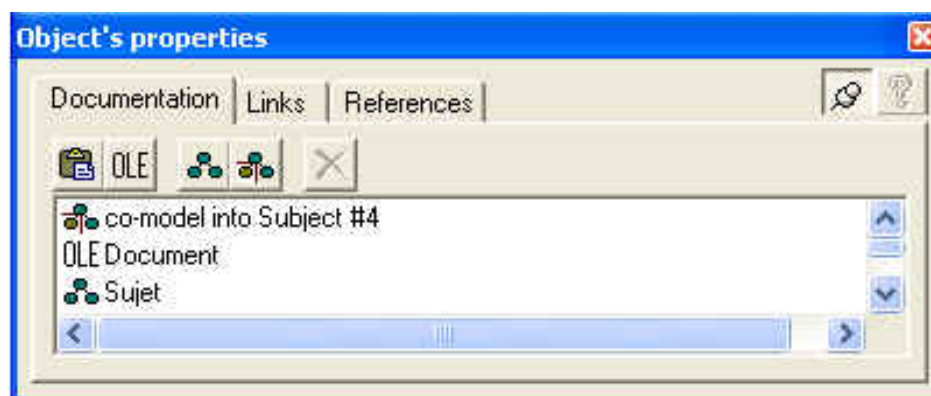
- **To detach an OLE document**, select the Knowledge Unit or Comment containing it, click on **Detach OLE document** on the submenu of the right click popup menu shown when pointing to one or the other of these types of objects.



When dealing with a grouped object, detach the OLE document by pointing to the object containing it and clicking on the command in the appropriate submenu of the right click popup menu.

6.2 Viewing the Properties of Graphic Objects


Dialog box displaying the properties of the selected graphic object. This box can remain open, making it possible to learn the properties of a series of objects as each one is selected in turn. When no object is selected, the model's properties are shown, for example, the model's name.

- Click on **Properties** on the **View** menu or the right click popup menu.
- When pointing to the model background or a grouped object background, the command appears directly in the right click popup menu.
- When pointing to a Knowledge Unit or a Link, the properties display command appears in the Knowledge or Link submenu of the right click popup menu, as the case may be.
- These commands open a **Properties** dialog box displaying the following information, depending on the object selected:
 - Depending on the graphic object selected, the dialog box can have up to three tabs: **Documentation**, **Link** and **References**.
 - The  button in the upper right corner closes the dialog box.
 - When pointing to the model background, the Object Properties command opens the Model Properties dialog box.



- The tab **Documentation** provides four ways to attach a document.
 - **Paste** : To attach an OLE document contained in the clipboard, click on **Paste**  button.
 - **OLE** : To attach from a list of OLE capable applications, click on the OLE  button.
 - **Associate model of definition** : To attach from a list of subject document, click on the Associate


model of definition  button.

- **Associate co-model** : To attach from a Project Manager list of subject document, click on the Associate co-model  button and select the subject.

- The tab **Link** provides the list of all the selected Knowledge Unit's input and output for the current model and any other model where it is referenced in the document. The Knowledge Unit's neighbors are sorted by type of link. For each type of link, the input or output Knowledge Units are named and sorted by type of Knowledge.
- The tab **References** lists all the models where the selected Knowledge Unit is referenced.

6.3 Creating a Knowledge Unit's Associated Lower Model

For a Knowledge Unit without any associated Lower Model, the following procedure displays an empty model where you can build one. If the Knowledge Unit has an associated Lower Model, it will display it, thus enabling you to view or edit it according to your needs.

- In the displayed model, select the Knowledge Unit for which you wish to develop or view a Lower Model and click on the  button on the **Model Windows Toolbar**.
- The **New Folder** command enables you to define the New folder.
- The **New subModel of definition** command enables you to define the subModel of definition.

[7. Export Tools](#)

- [7.1 Export to image file](#)
- [7.2 Export to EXCEL file](#)
- [7.3 Export to Access database](#)
- [7.4 Export to HTML](#)
- [7.5 Export to XML](#)
- [7.6 Export to IMS-LD](#)

7. Export Tools

MotPlus Export tools is the solution that allows you to convert graphic model into formatted Excel spreadsheets, HTML pages, Access database, XML file, image file and XML IMS-LD files.

7.1 Export to image file

The Export to image command in the Tools menu convert the select graphic model into the image file.

Selecting file formats

- PCX
- JPEG
- GIF
- TIFF
- BMP

7.2 Export to EXCEL file

The **Export to Excel** command in the Tools menu convert graphic Main Model and Lower Model into the Excel spreadsheets. The table below lists the data types supported by the MotPlus software.

- Name of knowledge
- Types of knowledge

7.3 Export to Access database

The **Export to Access** command in the Tools menu convert graphic model into the Access database. The table below lists the data types supported by the MotPlus software.

- Comments
- Types of knowledge
- Links
- Labels
- Model
- Projects
- References

7.4 Export to HTML

The **Export to HTML** command in the Tools menu convert graphic model into the HTML pages. The table below lists the data types supported by the MotPlus software.

- Comments
- Types of knowledge
- Links
- Labels
- Model
- Projects
- References

7.5 Export to XML

The **Export to XML** command in the Tools menu convert graphic model into the XML pages. The table below lists the data types supported by the MotPlus software.

- Comments
- Types of knowledge
- Links
- Labels
- Model
- Projects
- References

7.6 Export to IMS-LD

The **Export to IMS-LD** command in the Tools menu convert graphic model into the XML IMS-LD pages. The table below lists the data types supported by the MotPlus software.

To be able to export a IMS-LD model, you must have installed on your computer Microsoft .NET Framework version 1.1 and Microsoft Service Pack 1.

- Comments
- Types of knowledge
- Links
- Labels
- Model
- Projects
- References

[8. Labels](#)

- [8.1 Creating Labels](#)
- [8.2 Labelling objects](#)
- [8.3 Deleting Labels](#)

8. Labels

Under Construction

MotPlus enables you to create or delete a wide variety of labels. The labels can be created in two ways : Subject's labels windows or Project's labels windows. The maximum number of labels which one can select is 32.

8.1 Creating Labels

The **Labels** command on the **View** menu enables you to define the label on the Knowledge Unit.

- Select **Define** on the submenu of the **Labels Toolbar**.
- While pressing on the left mouse button in the label, move the cursor until the label is in the Subject's Labels windows or Project's Labels Windows.
- Click on the Ok button.

8.2 Labelling objects

Labels Toolbar provides quick access to a series of commands enabling you to create the Labels.

- Select the label on the list of the Subject's labels or Project's labels in the **Labels Toolbar**.
- Click on the Knowledge Unit.

8.3 Deleting Labels

The **Labels Toolbar** provides quick access to a series of commands enabling you to delete the Labels.

- Select the label on the list of Subject's labels or Project's labels in the **Labels Toolbar**.
- Click on the Knowledge Unit.

[9. Filters](#)

- [9.1 Displaying or Filtering Graphic Objects \(by type\)](#)
- [9.2 Marking Links as Hidden](#)

9. Filters

Under Construction

9.1 Displaying or Filtering Graphic Objects (by type)

If a model is particularly complicated or if part of a model seems rather secondary or for any other reasons related to specific layout needs, it could prove useful to be able to filter out certain types of knowledge units or Links or some of the Comments. This section deals with the use of MotPlus' layout filter function.

- **To display or filter certain types of knowledge units or Links**, click on Filters on the **View** menu. In the Filters dialog box, put a check mark next to any types of objects you wish to filter and deselect all those you wish to display.

The following figure illustrates a model before and after this filtering has occurred.



Filter Links by Type
<ul style="list-style-type: none">• This action affects all the Links that are of the types marked for filtering.
<ul style="list-style-type: none">• This action affects all the models in the document.
<ul style="list-style-type: none">• The filtered types are no longer accessible for creating new Links.
Mark Links as Hidden
<ul style="list-style-type: none">• This action applies to individual Links.
<ul style="list-style-type: none">• This action applies to individual models.
<ul style="list-style-type: none">• This action only affects existing Links.

- This action is independent of the type of link.
- Hidden Links may be redisplayed in broken-line format by clicking on a button.

The Links filtered out using the **Filters** dialog box cannot be redisplayed in broken-line format by clicking on **Show Hidden Links** on the **View** menu. This command only displays the non-filtered Links that are marked as hidden.

However, when the **Filters** dialog box is closed, Links marked as hidden are automatically shown in broken-line format. This way you can check the behaviour of a filter used on all Links, including those that were marked as hidden.

9.2 Marking Links as Hidden

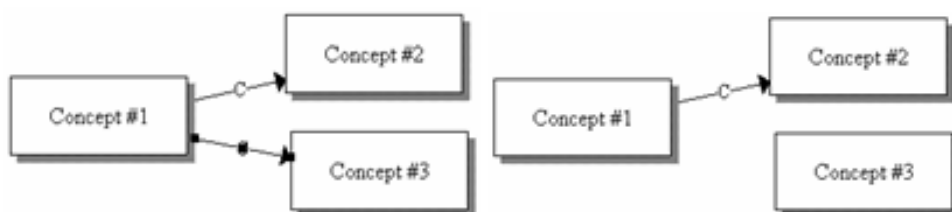
To simplify the display of your models, you might wish to hide one or more Links regardless of their type. Afterwards, if necessary, Hidden Links may be made to reappear in broken-line format. To do this, you proceed as follows:

9.2.1 Hiding Links

Select the Links to be hidden.

Select **Attributes** on the **Layout** menu *or* **Graphic Attributes** on the right click popup menu shown when pointing to the selected Links.

In the **Graphic Attributes** dialog box, put a check mark besides **Mark as hidden**.



9.2.2 Displaying Hidden Links

To display Hidden Links in broken-line format, click on **Show Hidden Links** on the **View** menu *or* the right click popup menu shown when pointing to the model background.



To hide them once again, just toggle one of the above-mentioned commands or button.

*To restore Hidden Links, display them in broken-line format, select the Link to be restored and deactivate the **Mark as hidden** check box in the **Graphic Attributes** dialog box.*

[10. Layers](#)

- [10.1 Layers MotPlus Subjects](#)

10. Layers

Under Construction

A projects can be made up of many layers and each layer can contain many objects. In MotPlus, the Layers window contains a list of layers and six kinds of tools (Create, Select, Delete, Activating object in the layer, Editing object, Activating objects in gray and Activating objects in mask).

Another way to create a unique effect is to use a mask. With masking, you can use a vector object to block out part of the underlying model.

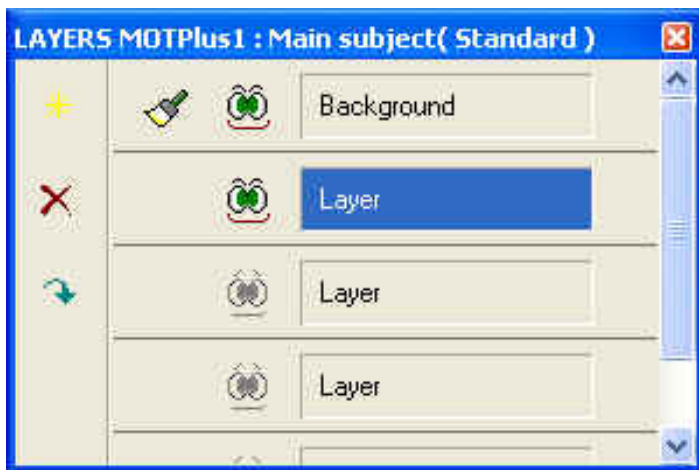
The **Layers Toolbar** displays the current state of all layers in the current model of a document. The name of the active layer is highlighted.


10.1 Layers MotPlus Subjects

The **Layers** command on the **View** menu enables you to define the label on the Knowledge Unit.

The **Layers Toolbar** provides quick access to a series of commands enabling you to create and edit the Layers.

The Layer's window contains six kinds of tools:





- **Creating layer**
 - Click on the **Layers Tollbar**.
 - Click on the creating button .


- **Select layer**

- Click on the **Layers Tollbar**.
- Click on the select button in the layers list .

- **Delete layer**

- Click on the **Layers Tollbar**.
- Click on the select button in the layers list .
- Click on the delete button .


- **Activating object in the layer 1.**

- Click on the **Layers Tollbar**.
- Click on the object in the **Button** layer.
- Click on the check box layer 1 .

- **Editing object.**

- Click on the **Layers Tollbar**.
- Click on the **Editing** layer button .

- **Activating objects in Gray**

- Click on the **Layers Tollbar**.
- Click on the **Gray** button on the list of layers .

- **Activating objects in Mask**

- Click on the **Layers Tollbar**.
- Click on the **Masking** button on the list of layers .

- [11.1 Variants command](#)

11. Variants

Under Construction

A projects can be made up of many variants and each variant can contain many objects. In MotPlus, the variants windows contains a list of variants and the tree kinds of tools (Create, fusion and delete)

Another way to create a unique effect is to use a mask. With masking, you can use a vector object to block out part of the underlying model.

The **Variants Toolbar** displays the current state of all variants in the current model of a document. The name of the active variant is highlighted and four kinds of tools (Gray Common variant, Changing a variant, Changing to the common and Selecting object in the variant).



11.1 Variants command

The **Variants** command on the **View** menu enables you to define the variant on the model Knowledge Unit.



The **Variants Toolbar** provides quick access to a series of commands enabling you to create and edit the variants.

The Variant's window contains tree kinds of tools :



- **Creating variant**

- Click on the **Variant** button in the **Variants Toolbar** : 
- Click on the creating button in the **Variant** windows : 

- **Deleting variant**


- Click on the **Variant** button in the **Variants Toolbar** : 
- Select the variant in the variants list.
- Click on the **Delete** button in the **Variant** windows : 

- **Fusionning variants.**

- Click on the **Variant** button in the **Variants Toolbar** : 
- Select the name of the variant in the variants list.
- Click on the **Fusion** button : 
- Click twice on the name of the variant in the variants list.

The **Variant's Toolbar** contains five kinds of tools :




- **Creating or selecting variant**

- Click on the **Variant** button in the **Variants Toolbar** : 




- **Gray Common variant**

- Click on the **Gray Common variant** button in the **Variants Toolbar** : 




- **Changing a variant**

- Click on the **Variant** button in the **Variants Toolbar** : 
- Select the name of variant.
- Select the object.
- Click on the **Gray Common variant** button in the **Variants Toolbar** : 
- Click on the **Change a variant** button: 

- **Changing to the common**

- Click on the **Variant** button in the **Variants Toolbar** : 
- Select the name of variant.
- Select the object.
- Click on the **Gray Common variant** button in the **Variants Toolbar** : 
- Click on the **Change to the common** button : 

- **Selecting object in the variant**

- Click on the **Variant** button in the **Variants Toolbar** : 
- Select the name of variant.
- Select the object.
- Click on the **Gray Common variant** button in the **Variants Toolbar** : 
- Click on the Used or not selected object in the variant button : 

12. Model Type

Under Construction

	Model Type			
	Standard	Flowchart	Educational	Ontology
Abstract Knowledge	Concept, procedure, option and principle	Concept, procedure and option	<p>Concept :</p> <ul style="list-style-type: none"> • Conference Service • Environnement • Index-Search Service • Learning Object or Outcome • Send-Mail Service <p>Procedure</p> <ul style="list-style-type: none"> • Act • Activity Structure • External Unit of learning • Learning Activity • Method • Play • Support Activity <p>Principle</p> <ul style="list-style-type: none"> • Time Limit • Learner role • Number of select • Staff role 	<p>Concept</p> <ul style="list-style-type: none"> • Class • Datatype <ul style="list-style-type: none"> ◦ <i>string</i> <ul style="list-style-type: none"> ■ <i>normalizedString</i> <i>token</i> <i>Language</i> <i>IDREFS</i> <i>ENTITIES</i> <i>NMTOKEN</i> <i>NMTOKENS</i> <i>Name</i> <i>NCName</i> <i>ID</i> <i>IDREF</i> <i>ENTITY</i> ◦ <i>decimal</i> <ul style="list-style-type: none"> ■ <i>Integer</i> <i>nonPositiveInteger</i> <i>negativeInteger</i> <i>long</i> <i>int</i> <i>short</i> <i>byte</i> <i>nonNegativeInteger</i> <i>unsignedLong</i> <i>unsignedInt</i> <i>unsignedShort</i> <i>unsignedByte</i> <i>positiveInteger</i> ◦ <i>boolean</i> ◦ <i>float</i> ◦ <i>double</i> ◦ <i>duration</i> ◦ <i>dateTime</i> ◦ <i>time</i> ◦ <i>date</i> ◦ <i>gYearMonth</i> ◦ <i>gYear</i> ◦ <i>gMonthDay</i> ◦ <i>gDay</i> ◦ <i>gMonth</i> ◦ <i>hexBinary</i> ◦ <i>base64Binary</i> ◦ <i>anyURI</i> ◦ <i>QName</i>

				<ul style="list-style-type: none"> ◦ <i>Notation</i>
				Principe <ul style="list-style-type: none"> • Propriety • Cardinality • Cardinality min. • Cardinality max.
Concrete Knowledge	Fact	None	Fact <ul style="list-style-type: none"> • Item • Learning Objective • Metadata Ref • Prerequisites 	Fact <ul style="list-style-type: none"> • Individu
Untyped Knowledge	Yes	None	None	None
Comment	Yes	Yes	Yes	Yes
Links	-Composition single (C) - Composition multiple (C*) - Specialisation (S) le lien de - Precedence (P) - Input or Product (I/P) -Regulation (R) -Instanciation -Untyped link	-Composition single (C) Composition Multiple (C*) Precedence (P), - Input or Product (I/P) -Untyped link	-Composition (C) -Specialisation (S) - Precedence (P) -Intrant-Produit (I/P) - Regulation (R) -Application (A).	-Composition (C) -Instanciation (I) -Regulation (R) -Specialisation (S) -Equivalent (Equi) -Inverse (INV) -Complement de (Comp) -Disjoint avec (Disj) -Identique (Ident) -Different de (Diff)
Copy in the Standard Lower Model	Copy all objects	Copy only the concepts, the procedures and is links.	Delete all objects	Delete all objects
Main model	Yes	Yes	Yes	Yes
Associate model of Clarification	Yes	Yes	Yes	Yes
Associate model of definition	Yes	Yes	Yes	Yes
Associate Co-modèle	Yes	Yes	Yes	Yes
Copy in the Flowchart Lower Model	Copy only the concepts, the procedures and is links.	Copy all objects	Delete all objects	Delete all objects

Build a Lower Model	Build a Standard Lower Model	Build a Standard Lower Model	Build a Educationnal Lower Model	Build a Ontology Lower Model
Copy in the Educational Lower Model	Copy only concepts, procedures, principes, Facts and is links.	Copy only the concepts, the procedures and is links.	Copy all objects	Delete all objects
Copy in the Ontology Lower Model	Copy only concepts, procedures, principes, Facts and is links.	Copy only the concepts, the procedures and is links.	Delete all objects	Copy all objects

13. Basic Functions (Standard)

- [13.1 Choose the Type of Model \(Standard\)](#)
- [13.2 Creating and Editing Graphic Objects \(Standard\)](#)
- [13.3 Creating Link \(Standard\)](#)
- [13.4 Selecting Graphic Objects \(Standard\)](#)
- [13.5 Moving Graphic Objects \(Standard\)](#)

13. Basic Functions (Standard)

Under Construction

This chapter explains MotPlus basic functions that you will use to create Standard Knowledge Models. These functions will help you to start Modelling with MotPlus as quickly as possible.

Advice is given on various valid actions to be performed with relation to the graphic objects (create, select, move).

Before reading this chapter, we recommend users to familiarise themselves with the terms described in the Section [Description of the MotPlus Work Window](#).

*Upon opening, MotPlus' model window displays a blank document titled **MotPlus1** where you can get right to work.*

13.1 Choose the Type of Model (Standard)

We must stress that choosing the type of model is a way to begin Modelling by adopting, at the very outset, a specific point of view on the concept being studied. This choice is important, since it determines the type of the Principal Knowledge Units and their Links.

The model's type is selected among the list described in *Knowledge Modelling Technique*. There are thirteen types of models. These are summarised in the following Table :

Type	Sub-type	Principal Knowledge Unit	Principal Links	Examples
	Factual System	Facts	I	Chronology of historical events Multiplication table

Conceptual System	Taxonomy	Concepts	S	Taxonomy of the animal kingdom
	System with Components	Concepts	C	Automobile with its sub-systems and components
	Hybrid Conceptual System	Concepts + Definitions + Procedural Attachments	S, C, R, I/P	Geometry, physics and economics definitions
	Serial Procedure	Procedures	P	Agenda of a meeting
Procedural System	Parallel Procedures	Procedures	P, C	Sports tournament with ranking by total of points
	Iterative Procedure	Procedures, Action Principles, Input and Product Concepts	P, I/P, C	Thermostat feedback loop
	Laws and Theories	Relational Principles	R, C, P	Relationship between symptoms and sickness
Prescriptive System	Decision Tree	Action Principles	P, C	Selection of a financial vehicle
	Control Structure	Action Principles	R, C, P	Project management principles
	Process	Algorithm Procedure, Concepts, and Action Principles	C, I/P, R	Diagnosis of a mechanical problem
Process/ Method	Method and Technique	Heuristic Procedure, Concepts, and Action Principles	C, I/P, R	Architectural design of a building Project planning
	Multi-agent Process	Procedure, Concepts and Principles (agents)	C, I/P, R	Writing a text as a team Budget planning in an organisation

13.2 Creating and Editing Graphic Objects (Standard)

As described in the Introduction, MotPlus helps users to create graphic objects representing the five types of knowledge (**Concepts, Procedures, Principles, Option** and **Facts**) defined in *Knowledge Modelling Technique*. MotPlus even allows you to insert **Undefined Knowledge Units** that do not fit into any of the regular categories. According to *Knowledge Modelling Technique*, this type can be associated to an object, such as a Skill, Learning Unit or Instrument, that links the current model to another knowledge domain through its associated Lower Model.









In MotPlus, the various types of knowledge can be joined using six types of links (**Composition, Regulation, Specialisation, Precedence, Input or Product** and **Instance**) according to the principles described in *Knowledge Modelling Technique*. There can be single (C) or multiple (C*) Composition Links between two Knowledge Units. When there are multiple links, Knowledge Unit A is composed of many examples of Knowledge Unit B rather than just one. The Multiple Composition Link is identified by the 'C*' tag.

MotPlus has an extra **Undefined Link (Yes or No)** to which you can give whatever name suits your purpose. For example, this Link can join a Skill to its related Knowledge Units.

In MotPlus, all these elements are considered graphic objects and any Modelling process must necessarily begin with learning the basic valid actions that may be performed on or with these graphic objects. We will now describe in detail the valid actions that may be performed in MotPlus.

13.2.1 Creating Graphic Objects (Standard)

Building a Knowledge Model essentially consists in creating, naming and linking various types of knowledge units in order to represent the user's perception of a specific domain of knowledge. One of the main actions is therefore to create the graphic objects (Knowledge Units and Links) required to illustrate the user's perception. If necessary, you can add Comments to your models. To create a graphic object, you proceed as follows:

- On the Editing Toolbar, click on the button showing the desired type of object among the following:
Concept ; **Procedure** ; **Principle** ; **Option** ; **Fact** ; **Undefined** ; **Link** ;
Comment .
- To create Concept, Procedure, Principle, Option, Fact, or Undefined objects, position the cursor in the model window wherever you wish to create the object. While pressing on the left mouse button, move the cursor until the object is the desired size. Release the mouse button. The object is in text editing mode. If applicable, enter the name of the new object. By right clicking on the Fact button in the toolbar, you will open a menu listing the various types of facts you can create. Click on the desired type of fact.




A check mark appears on the menu beside the type of fact that will be created.

- Example** : to create a Factual Knowledge Unit related to a Concept.

The lower right corner of Examples carries a  tag.

- **Trace** : to create a Factual Knowledge Unit related to a Procedure.

The lower right corner of Traces carries a  tag.

- **Statement** : to create a Factual Knowledge Unit related to a Principle.

The lower right corner of Traces carries a  tag.

- **To create a Comment** related to the model, Knowledge Unit or Knowledge Unit Link.


If, at the outset, the mouse cursor is pointing to the model background, the Comment will relate to the model as a whole. While holding down the left mouse button, move the mouse to form a box big enough to hold your Comment. Release the mouse button. You can then enter your Comment text. When the Comment is selected, an arrow's head faces the centre right handle (when pointing to the arrow handle with the mouse, the cursor changes into crossed double arrows). If necessary, you can associate this Comment to a Knowledge Unit or Link by dragging the arrow's head to the related Knowledge Unit or Link.

If, at the outset, the mouse is pointing to a Knowledge Unit or Link, the new Comment will be directly related to that Knowledge Unit or Link. While holding down the left mouse button, move the mouse and release the button wherever you wish to insert your Comment. A box appears related to the Knowledge Unit or Link where you may enter your Comment text. If necessary, the Comment can be linked to another Knowledge Unit, Knowledge Unit Link or the Knowledge Model itself by dragging the arrow's link.


13.3 Creating Link (Standard)

From Links : to create a Factual Knowledge Unit unrelated to any Knowledge Unit. Its nature will be defined by the type of Knowledge Unit to which it is eventually linked.

The lower right corner of such a type of fact has no tag.

- **To create another object of the same type**, repeat the preceding step. The same button remains selected until you click on another command, so you can keep creating more objects of the same type.
- **To create a link between two Knowledge Units**, click on the  button and select one of the two following procedures.
In the model window, click on the source Knowledge Unit and drag and drop the link head on the destination Knowledge Unit.

The system then creates the type of link selected in accordance with the integrated (knowledge relationship) Grammar Rules. If valid, the Composition Link is chosen by default.

- By right clicking on the  button in the toolbar, you will open a menu listing the various types of links you can create. Click on the desired type of link and follow the previously explained procedure.



By default, a **Single Link** is created for **Composition Links**. If you select a **Multiple Composition Link**, it will be symbolised by 'C*' in the model.

If the Grammar Rules permit it, the system creates the selected type of link. If not, MotPlus automatically applies one of the links that are valid in the context.

A check mark appears on the menu beside the type of link that will be created.

13.3.1 Table of Grammar Rules (Standard)

The following Table summarises the valid Links between the various pairs of Knowledge Units.

Destination	Abstract Knowledge				Fact			
From	Concept	Procedure	Principle	Option	Fact	Exemple	Trace	Statement
Concept	C, C*, S, NT	IP, NT	NT	None	C,C*, I, NT	C, C*,I, NT	NT	NT
Procedure	IP, NT	C, C*, S, P, NT	C,C*, P, NT	P	C,C*, I, NT	NT	C, C*, I, NT	NT
Option	None	Yes, No, NT	None	NT	None	None	None	None
Principle	R, NT	C, C*, P, R, NT	C, C*, S, P, R, NT	None	C,C*, I, NT	NT	NT	C, C*, I, NT
Fact	NT	NT	NT	None	C,C*, R, NT	IP, NT	C,C*, P, NT	C,C*, P, NT
Exemple	NT	NT	NT	None	IP, NT	C, C*, NT	IP, NT	NT
Trace	NT	NT	NT	None	C, C*, P, NT	IP, NT	C, C*, P, NT	C, C*, P, NT

Statement	NT	NT	NT	None	C, C*, P, R, NT	R, NT	C, C*, P, R, NT	C, C*, P, R, NT
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Refer to **Knowledge Modelling Technique** for more information about the Grammar Rules governing the linking of different types of knowledge units.

13.3.2 Grammar Rule Exceptions (Standard)

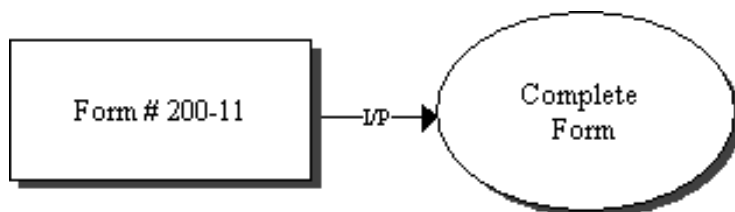
The Grammar Rules are defined in *Knowledge Modelling Technique*. However, MotPlus allows certain exceptions.

- When you create a Link that does not abide by the Grammar Rules and there are no other alternatives, MotPlus enables you to generate an Undefined Link.
- Upon creation, Undefined Links go immediately into Text Edit mode. You can then immediately identify your Link according to your needs.
- A Composition Link is always permitted between an Undefined Knowledge Unit and all other types of knowledge units.
- A Composition Link is permitted between a Concept and an Undefined Knowledge Unit.
- In the current version of MotPlus, the AP links mentioned in the Grammar Rules are represented by Undefined Links.

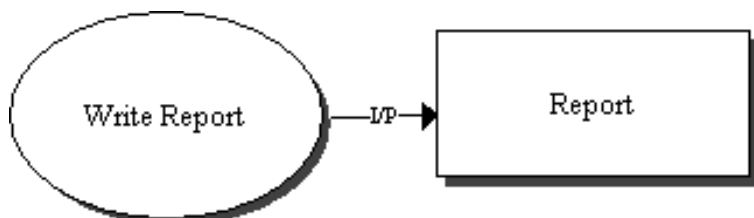
13.3.3 Suggestions on How to Use Knowledge Units and Links (Standard)

Here are some suggestions related to specific Modelling situations.

- **To illustrate an object used to perform a procedure**, join the **Concept** -type Knowledge Unit joined to the Procedure using an I/P link.

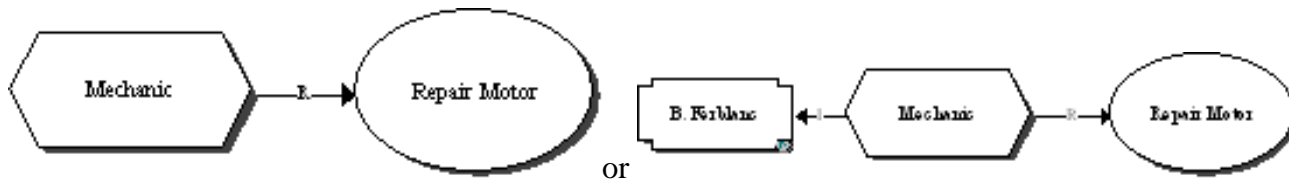


- **To illustrate an object produced by a procedure**, join the Procedure to the **Concept** -type Knowledge Unit using an I/P link.



- To illustrate an actor or a person in charge of a procedure, join the **Principle** -type Knowledge Unit to the Procedure using an R link.

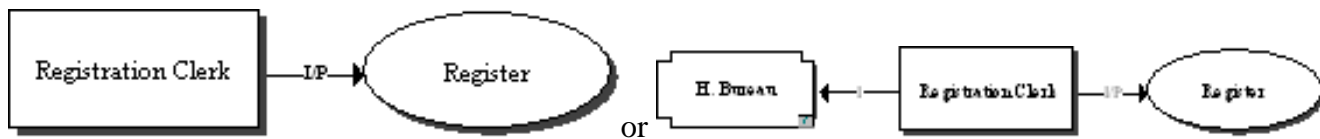
If appropriate, using an I link, join the Concept to a **Fact** -type Knowledge Unit indicating the name of the person.



In this example, the use of a Principle and an R link tells the reader that the actor or the person in charge affects or controls the Procedure.

- To illustrate a resource person, use a **Concept** -type Knowledge Unit.

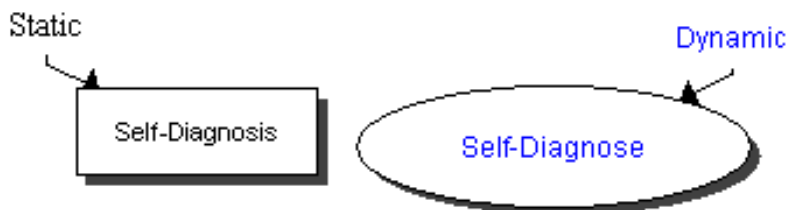
If appropriate, join the Concept using an I link to a **Fact** -type Knowledge Unit indicating the name of the person.



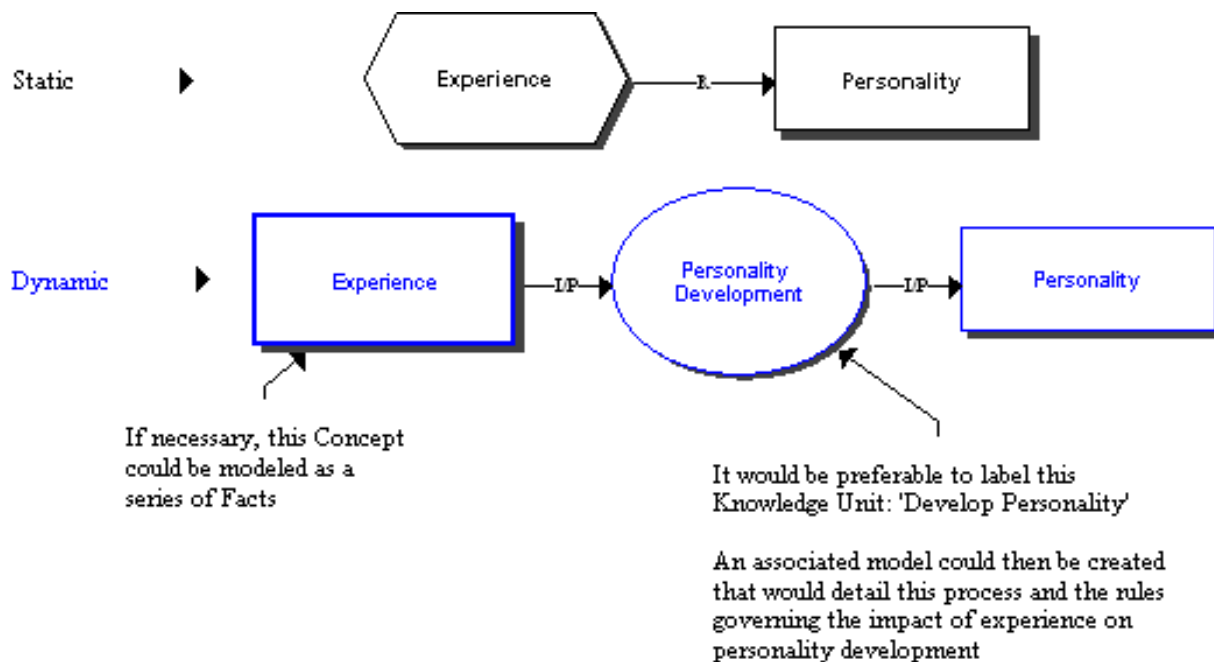
In this example, the use of a Concept and an I/P link tells the reader that the actor is a source of information useful to the Procedure.

- To illustrate the dynamics of a knowledge domain, use Procedures.

If at all possible, identify your procedures using a verb.



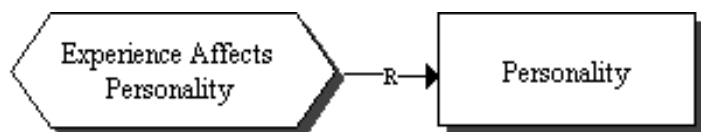
Or, as in the following example, use a term that defines a process.



In this example, the static model only enables the user to illustrate that experience has an impact on personality (i.e. it represents a set of knowledge establishing the causal link). It would seem more usual to consider experience as knowledge describing the nature of objects such as events, situations, and background. In the dynamic model, experience is represented by a Concept. The Procedure features a 'Personality Development' process, which can eventually be illustrated by a Lower Model describing the process and the rules governing the relative impact of experience.

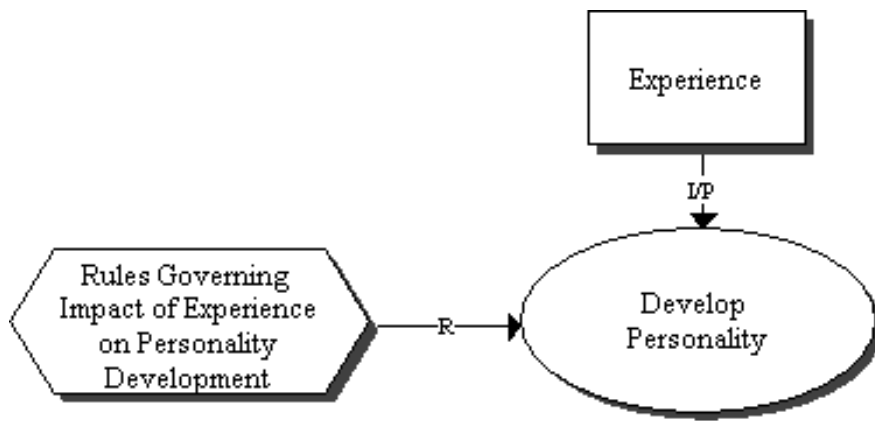
- **To illustrate Principle-Concept Relationships:**

According to the **Grammar Rules** defined in *Knowledge Modelling Technique*, the only direct Link permitted between these two types of knowledge units is a **Regulation Link** (R link). In the following example, the statement 'Experience Affects Personality' is illustrated using a Principle governing the Concept 'Personality'.

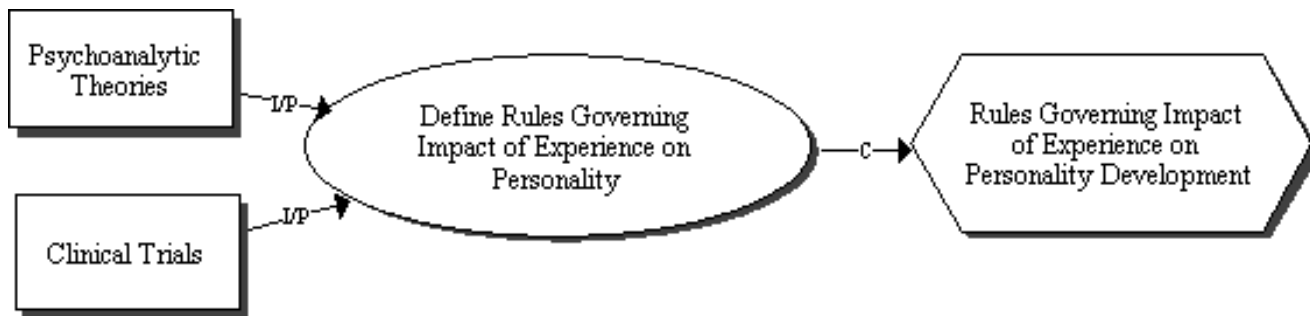


Otherwise, concept-principle relationships are usually illustrated using Procedures or Skills. Here are a few examples:

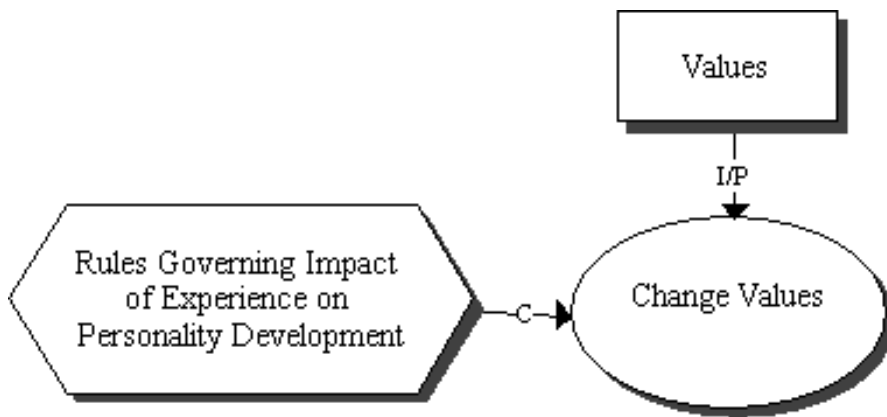
- In the following figure, the 'Experience' Concept related to the impact rules is illustrated as input into the 'Develop Personality' process governed by the Principle.



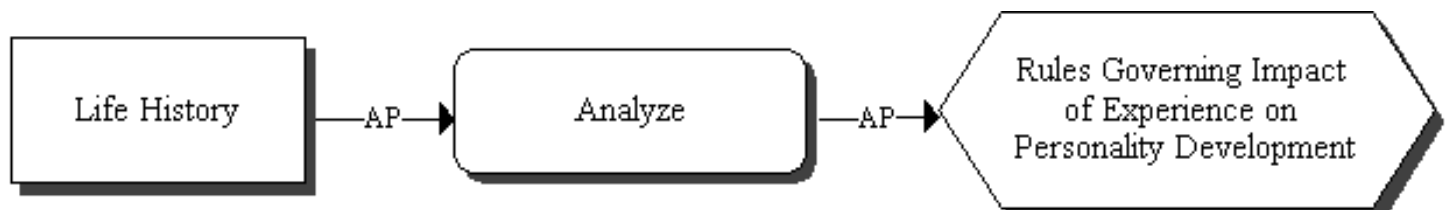
- In the following figure, the Concepts used to define the impact rules are input to the Procedure illustrating the action.



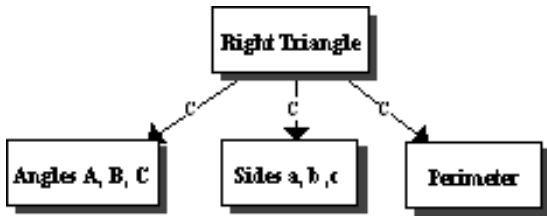
- In the following figure, the Concepts used by the impact rules are illustrated as input to the procedural component of the corresponding Principle.



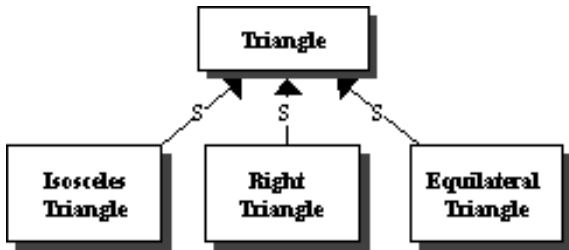
- In the following figure, the 'Life History' is processed by the 'Analyze' Skill to induce the rules governing the impact of experience on personality.



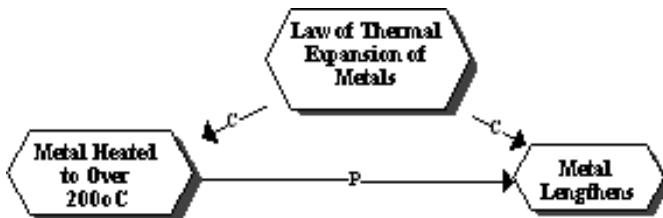
- To Illustrate a Knowledge Unit using its components, use C links from this Knowledge Unit to each of its component Knowledge Units.



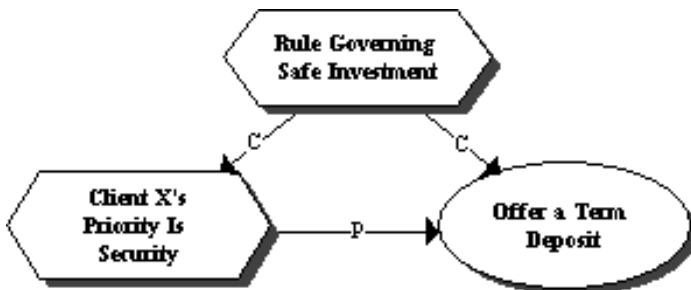
- To Illustrate a Knowledge Unit using its categories, use S links from the category Knowledge Units to the described Knowledge Unit.



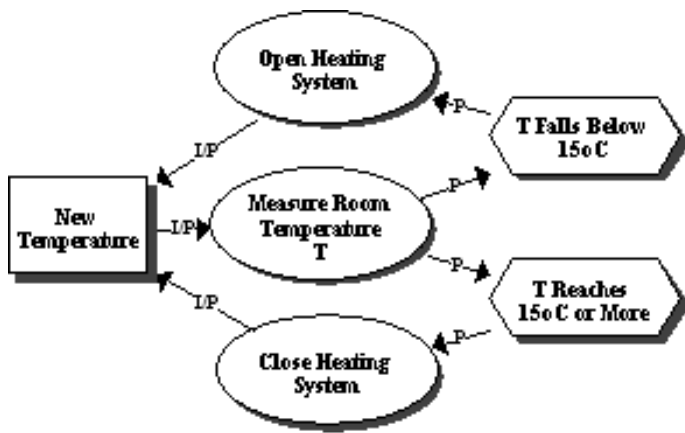
- To illustrate a relational Principle in an 'IF (condition). THEN (effect) ' format, use a **Principle** -type Knowledge Unit describing the **IF** condition joined by a P link to another **Principle** -type Knowledge Unit defining the **THEN** effect.



- To illustrate an action Principle in an 'IF (condition). THEN (action) ' format, use a **Principle** -type Knowledge Unit describing the **IF** condition joined by a P link to another **Principle** -type Knowledge Unit defining the **THEN** action.



- To illustrate an iterative procedure including one or more action loops, use decision Principles in the 'IF (condition). THEN (action) ' format.




- To view the valid Links between two types of knowledge units, create a Link between the two. Point to the selected Link and display the right click popup menu. Open the **Type** submenu (see **Changing the Type of an Existing Knowledge Unit or Link**): the system lists as active commands all the valid types of links between the two Knowledge Units. When needed, select one of the valid types of links.

*You can also consult the following Table before creating a Link and, then, choose the appropriate Link in the right click popup menu (see **Changing the Type of an Existing Knowledge Unit or Link**).*

It is then a question of replacing Undefined with AP.

13.4 Selecting Graphic Objects (Standard)

Selecting is a basic function of all actions involving graphic objects, including moving, copying, deleting, editing, and displaying the Lower Model This section describes how to select one or more graphic objects and how to resize the Knowledge Unit and Comment objects.

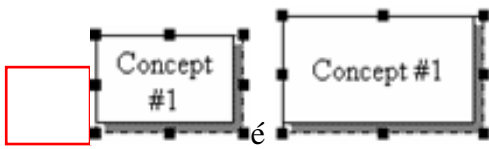
Clicking on the  button on the Editing Toolbar activates the Select command mode. It is automatically activated when you perform any equivalent action, e.g. clicking on an object on the model background.

- To select a graphic object, just click on the desired object.

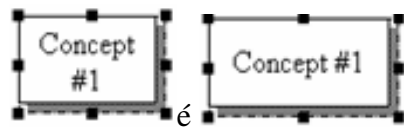
The selected graphic object (Knowledge Unit or Comment) is bordered by an 8-handled box.

To be able to drag a handle, the mouse must first be pointing to it. The pointer changes into a double-headed arrow according to the valid actions to perform for the selected handle.

The corner handles enable you to resize the selected object horizontally and/or vertically. Place the mouse pointer on one of these handles and hold down the mouse button to resize the object.



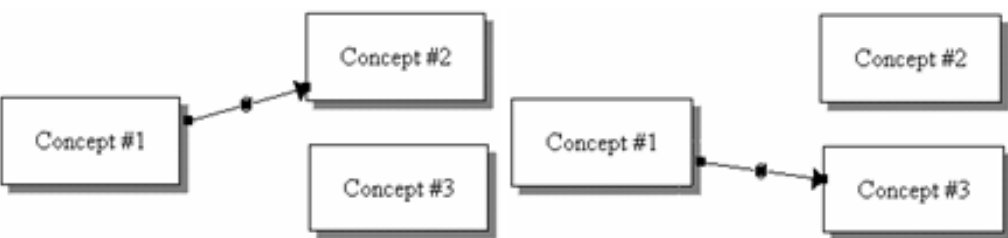
The side handles enable you to resize the selected object only horizontally or only vertically. Place the mouse pointer on one of these handles and hold down the mouse button to resize the object.



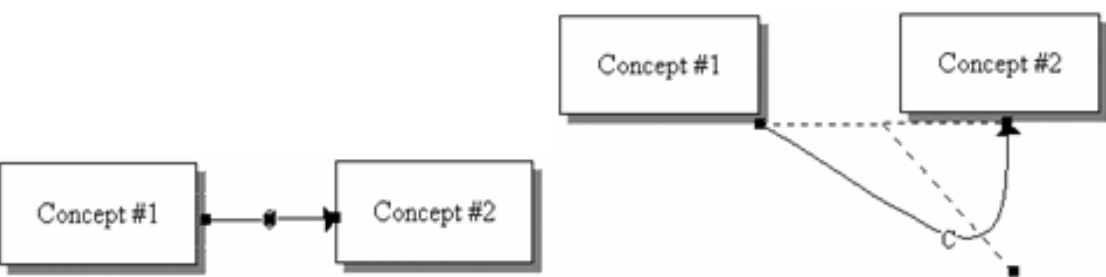
You know a Link is selected when you can see its handles.

To be able to drag a handle, the mouse must first be pointing to it. The pointer takes the shape of crossed double arrows indicating that you can move in any direction.

Using the handles at either end, you can move a Link from one Knowledge Unit to another. Place the mouse pointer on one of the handles and drag and drop it onto the appropriate position.



The centre handle enables you to change the link's curve to suit your needs in terms of graphical layout.



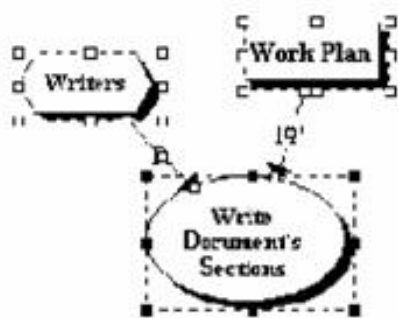
. **To select a group of graphic objects**, point to the model window background and, while pressing the left mouse button move the mouse drawing a box encompassing all the objects to be selected. Release the mouse button.

If it is not possible to include the desired objects in an box, press and hold the CTRL or SHIFT key and click on each graphic object to be included or excluded in the selection.

All the selected graphic objects are identified by their visible handles.

*In a group selection, there is always by default one **dominant** selection. In the following example, the three*

Knowledge Units are selected. The dominant Knowledge Unit, the one that will serve as a template for many commands, is identified by its dark handles, while those of the other two Knowledge Units are white. Note that in a group selection, it is always possible to change dominant selection by clicking on another object.



*Certain commands (ex. box **Attributes** commands) will affect all the selected Knowledge Units, others (ex. **Go to Lower Model** or change **Type**) will only apply to the dominant Knowledge Unit (in our example: Write Document's Sections).*

*You can also select all the graphic objects in a model by clicking on **Select All** on the Edit menu or the right click popup menu shown when pointing to the model background.*

13.5 Moving Graphic Objects (Standard)

It is sometimes useful to distribute the various graphic objects in such a way as to illustrate the model more clearly. In this section, we will show you how to move one or more Knowledge Units or Comments, change the source and destination of a link or modify its curve.

- **To move one or more Knowledge Units or Comments**, select the desired object(s), point to the selection and drag and drop it onto the selected location.
- **To change the source or destination of a link**, select the link and drag and drop the appropriate handle onto the desired Knowledge Unit.

*To invert a link, go to the **Link** submenu of the right click popup menu shown when pointing to the Link, and click on **Invert**.*

*See also **Moved or Copied Link's Name Changes**.*

- **To change a Link's curve**, select a link and drag the centre handle until the link has the desired curve.

[14. Basic Functions \(Flowchart\)](#)

- [14.1 Choose the Type of Model \(Flowchart\)](#)
- [14.2 Creating and Editing Graphic Objects \(Flowchart\)](#)
- [14.3 Creating Link \(Flowchart\)](#)
- [14.4 Selecting Graphic Objects \(Flowchart\)](#)
- [14.5 Moving Graphic Objects \(Flowchart\)](#)

14. Basic Functions (Flowchart)

Under Construction

This chapter explains MotPlus' basic functions that you will use to create Flowchart Knowledge Models. These functions will help you to start Modelling with MotPlus as quickly as possible.

MotPlus **Flowchart** is the perfect tool for creating all kinds of business diagrams, from flowcharts and org charts to floor plans and technical diagrams.

Advice is given on various valid actions to be performed with relation to the graphic objects (create, select, move).

14.1 Choose the Type of Model (Flowchart)

We must stress

that choosing the type of model is a way to begin Modelling by adopting, at the very outset, a specific point of view on the concept being studied. This choice is important, since it determines the type of the Principal Knowledge Units and their Links.

14.2 Creating and Editing Graphic Objects (Flowchart)

MotPlus helps users to create **Flowchart** graphic objects representing the tree types of knowledge (**Concepts**, **Procedures** and **Option**) defined in *Knowledge Modelling Technique*. According to *Knowledge Modelling Technique*, this type can be associated to an object, such as a Skill, Learning Unit or Instrument, that links the current model to another knowledge domain through its associated Lower Model.






In MotPlus, the various types of knowledge can be joined using five types of links (**Composition**, **Precedence** and **Input or Product**) according to the principles described in *Knowledge Modelling Technique*. There can be single (C) or multiple (C*) Composition Links between two Knowledge Units. When there are multiple links, Knowledge Unit A is composed of many examples of Knowledge Unit B rather than just one. The Multiple Composition Link is identified by the 'C*' tag.

MotPlus has an extra **Untyped Link (Yes or No)** to which you can give whatever name suits your purpose. For example, this Link can join a Skill to its related Knowledge Units.

In MotPlus, all these elements are considered graphic objects and any Modelling process must necessarily begin with learning the basic valid actions that may be performed on or with these graphic objects. We will now describe in detail the valid actions that may be performed in MotPlus:

14.2.1 Creating Graphic Objects (Flowchart)

Building a Knowledge Model essentially consists in creating, naming and linking various types of knowledge units in order to represent the user's perception of a specific domain of knowledge. One of the main actions is therefore to create the graphic objects (Knowledge Units and Links) required to illustrate the user's perception. If necessary, you can add Comments to your models. To create a graphic object, you proceed as follows:

- On the Editing Toolbar, click on the button showing the desired type of object among the following:
Concept ; **Procedure** ; **Option** ; **Link** ; **Comment** .
- **To create Concept, Procedure or Option**, position the cursor in the model window wherever you wish to create the object. While pressing on the left mouse button, move the cursor until the object is the desired size. Release the mouse button. The object is in text editing mode. If applicable, enter the name of the new object.
- **To create a Comment** related to the model, Knowledge Unit or Knowledge Unit Link. If, at the outset, the mouse cursor is pointing to the model background, the Comment will relate to the model as a whole. While holding down the left mouse button, move the mouse to form a box big enough to hold your Comment. Release the mouse button. You can then enter your Comment text. When the Comment is selected, an arrow's head faces the centre right handle (when pointing to the arrow handle with the mouse, the cursor changes into crossed double arrows). If necessary, you can associate this Comment to a Knowledge Unit or Link by dragging the arrow's head to the related Knowledge Unit or Link.


If, at the outset, the mouse is pointing to a Knowledge Unit or Link, the new Comment will be directly related to that Knowledge Unit or Link. While holding down the left mouse button, move the mouse and release the button wherever you wish to insert your Comment. A box appears related to the Knowledge Unit or Link where you may enter your Comment text. If necessary, the Comment can be linked to another Knowledge Unit, Knowledge Unit Link or the Knowledge Model itself by dragging the arrow's link.

14.3 Creating Link (Flowchart)

From Links : to create a Factual Knowledge Unit unrelated to any Knowledge Unit. Its nature will be defined by the type of Knowledge Unit to which it is eventually linked.

The lower right corner of such a type of fact has no tag.


*See also **Changing the Type of an Existing Knowledge Unit or Link**.*

- **To create another object of the same type**, repeat the preceding step. The same button remains selected until you click on another command, so you can keep creating more objects of the same type.
- **To create a link between two Knowledge Units**, click on the  button and select one of the two

following procedures.

In the model window, click on the source Knowledge Unit and drag and drop the link head on the destination Knowledge Unit.

The system then creates the type of link selected in accordance with the integrated (knowledge relationship) Grammar Rules. If valid, the Composition Link is chosen by default.

- By right clicking on the  button in the toolbar, you will open a menu listing the various types of links you can create. Click on the desired type of link and follow the previously explained procedure.



*By default, a **Single** Link is created for **Composition** Links. If you select a **Multiple** Composition Link, it will be symbolised by 'C*' in the model.*

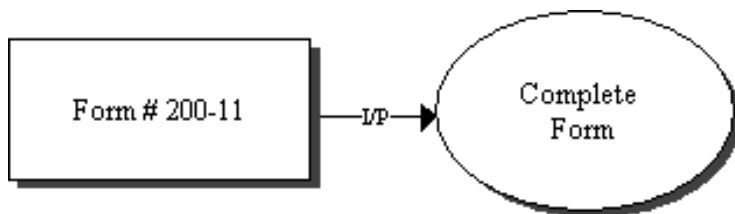
If the Grammar Rules permit it, the system creates the selected type of link. If not, MotPlus automatically applies one of the links that are valid in the context.

A check mark appears on the menu beside the type of link that will be created.

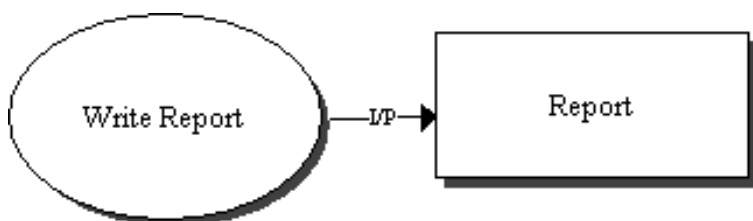
14.3.1 Suggestions on How to Use Knowledge Units and Links (Flowchart)

Here are some suggestions related to specific Modelling situations.

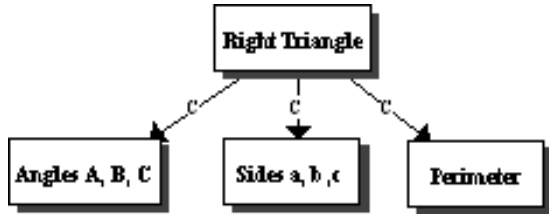
- **To illustrate an object used to perform a procedure**, join the **Concept** -type Knowledge Unit joined to the Procedure using an I/P link.



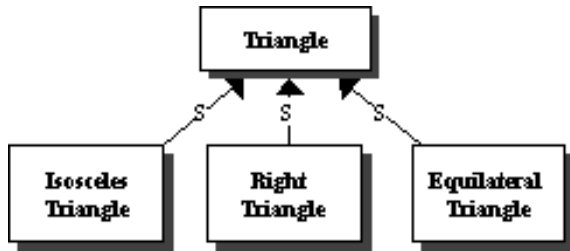
- **To illustrate an object produced by a procedure**, join the Procedure to the **Concept** -type Knowledge Unit using an I/P link.



- To Illustrate a Knowledge Unit using its components, use C links from this Knowledge Unit to each of its component Knowledge Units.



- To Illustrate a Knowledge Unit using its categories, use S links from the category Knowledge Units to the described Knowledge Unit.



14.3.2 Table of Grammar Rules (Flowchart)

The following Table summarises the valid Links between the various pairs of Knowledge Units.

Destination	Abstract Knowledge		
From	Concept	Procedure	Option
Concept	C, C*	IP	None
Procédure	IP	C, C*	P
Option	None	Yes, No, NT	NT

Refer to *Knowledge Modelling Technique* for more information about the Grammar Rules governing the linking of different types of knowledge units.

14.3.1 Grammar Rule Exceptions (Flowchart)


The Grammar Rules are defined in *Knowledge Modelling Technique*. However, MotPlus allows certain exceptions.

- When you create a Link that does not abide by the Grammar Rules and there are no other alternatives, MotPlus enables you to generate an Untyped Link.
- Upon creation, Untyped Links go immediately into Text Edit mode. You can then immediately identify your Link according to your needs.

It is then a question of replacing Untyped with AP.

14.4 Selecting Graphic Objects (Flowchart)

Selecting is a basic function of all actions involving graphic objects, including moving, copying, deleting, editing, and displaying the Lower Model. This section describes how to select one or more graphic objects and how to resize the Knowledge Unit and Comment objects.

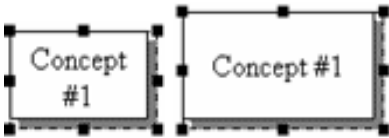
Clicking on the  button on the Editing Toolbar activates the Select command mode. It is automatically activated when you perform any equivalent action, e.g. clicking on an object on the model background.

- **To select a graphic object**, just click on the desired object.

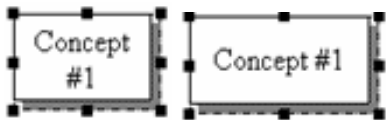
The selected graphic object (Knowledge Unit or Comment) is bordered by an 8-handled box.

To be able to drag a handle, the mouse must first be pointing to it. The pointer changes into a double-headed arrow according to the valid actions to perform for the selected handle.

The corner handles enable you to resize the selected object horizontally and/or vertically. Place the mouse pointer on one of these handles and hold down the mouse button to resize the object.



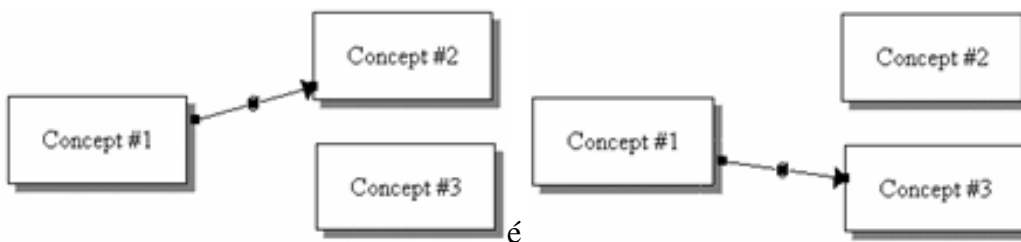
The side handles enable you to resize the selected object only horizontally or only vertically. Place the mouse pointer on one of these handles and hold down the mouse button to resize the object.



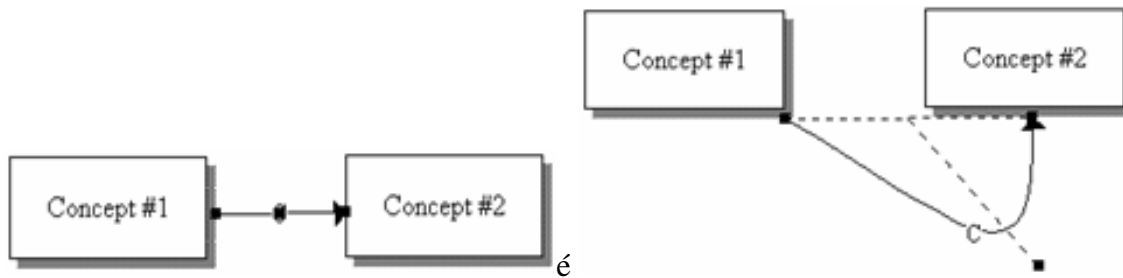
You know a Link is selected when you can see its handles.

To be able to drag a handle, the mouse must first be pointing to it. The pointer takes the shape of crossed double arrows indicating that you can move in any direction.

Using the handles at either end, you can move a Link from one Knowledge Unit to another. Place the mouse pointer on one of the handles and drag and drop it onto the appropriate position.



The centre handle enables you to change the link's curve to suit your needs in terms of graphical layout.



- **To select a group of graphic objects**, point to the model window background and, while pressing the left mouse button move the mouse drawing a box encompassing all the objects to be selected. Release the mouse button.

*You can also select all the graphic objects in a model by clicking on **Select All** on the Edit menu or the right click popup menu shown when pointing to the model background.*

14.5 Moving Graphic Objects (Flowchart)

It is sometimes useful to distribute the various graphic objects in such a way as to illustrate the model more clearly. In this section, we will show you how to move one or more Knowledge Units or Comments, change the source and destination of a link or modify its curve.

- **To move one or more Knowledge Units or Comments**, select the desired object(s), point to the selection and drag and drop it onto the selected location.
- **To change the source or destination of a link**, select the link and drag and drop the appropriate handle onto the desired Knowledge Unit.

*To invert a link, go to the **Link** submenu of the right click popup menu shown when pointing to the Link, and click on **Invert**.*

*See also **Moved or Copied Link's Name Changes**.*

- **To change a Link's curve**, select a link and drag the centre handle until the link has the desired curve.

[15. Basic Functions \(Educational\)](#)

- [15.1 Choose the Type of Model \(Educational\)](#)
- [15.2 Creating and Editing Graphic Objects \(Educational\)](#)
- [15.3 Types of links](#)
- [15.4 Creating Link \(Educational\)](#)
- [15.5 Table of Grammar Rules \(Educational\)](#)
- [15.6 Selecting Graphic Objects \(Educational\)](#)
- [15.7 Moving Graphic Objects \(Educational\)](#)
- [15.8 Labels \(Educational\)](#)

15. Basic Functions (Educational)

Under Construction

This chapter explains MotPlus' basic functions that you will use to create Educational IMS Learning Design Knowledge Models.

The IMS Learning Design specification supports the use of a wide range of pedagogies in online learning. Rather than attempting to capture the specifics of many pedagogies, it does this by providing a generic and flexible language. This language is designed to enable many different pedagogies to be expressed. The approach has the advantage over alternatives in that only one set of learning design and runtime tools then need to be implemented in order to support the desired wide range of pedagogies.

Advice is given on various valid actions to be performed with relation to the graphic objects (create, select, move, copy, delete, remove, etc.).

*Upon opening, MotPlus' model window displays a blank document standard model titled **MotPlus1** where you can get right to work.*

15.1 Choose the Type of Model (Educational)

We must stress that choosing the type of model is a way to begin Modelling by adopting, at the very outset, a specific point of view on the concept being studied. This choice is important, since it determines the type of the Principal Knowledge Units and their Links.

The **Educational** command on the **Model Type** menu enables you to create a Educational IMS Learning Design graphic objects.

Note : The objects not-specific to the Educational model will be destroyed.

15.2 Creating and Editing Graphic Objects (Educational)

MotPlus helps users to create Educational graphic objects representing the four types of knowledge

(**Procedures, Concepts, Principles and Facts**) defined in *Knowledge Modelling Technique*.

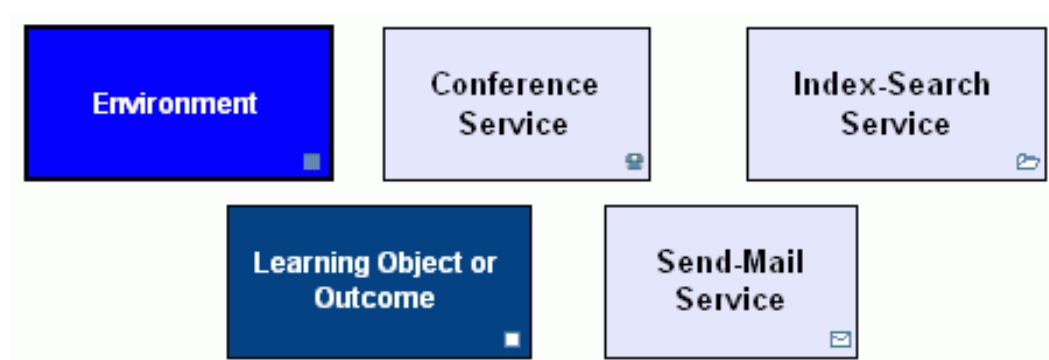
Procedure

The seven different types of procedure are : **Method, Play, Act, Activity Structure, Learning Activity, Support Activity** and **External Unit of learning**.



Concept

The five different types of **Concept** are : **Environment, Conference Service, Index-Search Service, Learning Object or Outcome** and **Send-Mail Service**.



Principle

The four different types of **Principle** are : **Learning Role, Staff Role, Number to select** and **Time limit**.



Fact

The four different types of **Fact** are : **Learning Objectif, Prerequisites, Item** and **Metadata**.

15.2.1 Creating Graphic Objects (Educational)

Building a Knowledge Model essentially consists in creating, naming and linking various types of knowledge units in order to represent the user's perception of a specific domain of knowledge. One of the main actions is therefore to create the graphic objects (Knowledge Units and Links) required to illustrate the user's perception. If necessary, you can add Comments to your models. To create a graphic object, you proceed as follows:

- On the Editing Toolbar, click on the button showing the desired type or sub-type of object among the following: **Concept** ; **Procedure** ; **Principle** ; **Fact** ; **Link** ; **Comment**.
- To create **Concept**, **Procedure**, **Principle** or **Fact** position the cursor in the model window wherever you wish to create the object. While pressing on the left mouse button, move the cursor until the object is the desired size. Release the mouse button. The object is in text editing mode. If applicable, enter the name of the new object. By right clicking on the concept, procedure, principle or fact button in the toolbar, you will open a menu listing the various types of concept, procedure, principle or fact you can create. Click on the desired type of Concept, Procedure, Principle or Fact.
- **To create a Comment** related to the model, Knowledge Unit or Knowledge Unit Link.

If, at the outset, the mouse cursor is pointing to the model background, the Comment will relate to the model as a whole. While holding down the left mouse button, move the mouse to form a box big enough to hold your Comment. Release the mouse button. You can then enter your Comment text. When the Comment is selected, an arrow's head faces the centre right handle (when pointing to the arrow handle with the mouse, the cursor changes into crossed double arrows). If necessary, you can associate this Comment to a Knowledge Unit or Link by dragging the arrow's head to the related Knowledge Unit or Link.

If, at the outset, the mouse is pointing to a Knowledge Unit or Link, the new Comment will be directly related to that Knowledge Unit or Link. While holding down the left mouse button, move the mouse and release the button wherever you wish to insert your Comment. A box appears related to the Knowledge Unit or Link where you may enter your Comment text. If necessary, the Comment can be linked to another Knowledge Unit, Knowledge Unit Link or the Knowledge Model itself by dragging the arrow's link.

15.3 Types of links

In MotPlus, the various Educational types of knowledge can be joined using six types of links (**Composition**, **Regulation**, **Precedence**, **Application**, **Input or Product** and **Instance**) according to the principles described in *Knowledge Modelling Technique*. There can be single (C) or multiple (C*) Composition Links between two Knowledge Units. When there are multiple links, Knowledge Unit A is composed of many examples of Knowledge Unit B rather than just one. The Multiple Composition Link is identified by the 'C*' tag.

MotPlus has an extra **Undefined Link** to which you can give whatever name suits your purpose. For example,

this Link can join a Skill to its related Knowledge Units.


In MotPlus, all these elements are considered graphic objects and any Modelling process must necessarily begin with learning the basic valid actions that may be performed on or with these graphic objects.

15.4 Creating Link (Educational)


From Links : to create a Factual Knowledge Unit unrelated to any Knowledge Unit. Its nature will be defined by the type of Knowledge Unit to which it is eventually linked.

The lower right corner of such a type of fact has no tag.

See also Changing the Type of an Existing Knowledge Unit or Link.

- **To create another object of the same type**, repeat the preceding step. The same button remains selected until you click on another command, so you can keep creating more objects of the same type.
- **To create a link between two Knowledge Units**, click on the  button and select one of the two following procedures.
In the model window, click on the source Knowledge Unit and drag and drop the link head on the destination Knowledge Unit.

The system then creates the type of link selected in accordance with the integrated (knowledge relationship) Grammar Rules. If valid, the Composition Link is chosen by default.

- By right clicking on the  button in the toolbar, you will open a menu listing the various types of links you can create. Click on the desired type of link and follow the previously explained procedure.

15.4.1 Suggestions on How to Use Knowledge Units and Links (Educational)

Here are some suggestions related to specific Modelling situations.

- The link of instantiation (I) connects a generic element and an authority (Item, Prerequisite ou Learning objective).
- The link of composition (C) connects certain elements to its components (Method, Play, Activity structure, role, environment).
- The link of precedence (P) connects some under type of procedures to illustrate the sequence between them (Act, Activity Structure, Learning Activity, Support Activity).
- The Input or Product : Input (Activity Structure, Learning Activity, Support Activity) and Product (Activity Structure, Learning Activity, Support Activity).
- The link of regulation (R) connects a role to an activity (Activity Structure, Learning Activity, Support Activity).

- The bond of (A) application connects a metadata to a generic element (Activity Structure, Learning Activity, Support Activity).

15.5 Table of Grammar Rules (Educational)

The following Table summarises the valid Links between the various pairs of Knowledge Units.


















































Destination	Generic															Instance						
Origine	Concept					Procédure							Principe				Fait					
																						
Concept																						
• Environnement 	C	C	C	C	C					IP	IP	IP										
• Learning Object or Outcome 																			I			
• Conference Service 																			I			
• Send-Mail Service 																			I			
• Index-Search Service 																			I			

Table 1 : Concept

Destination	Generic														Instance				
From	Concept					Procedure							Principle				Fact		
																			
Procedure																			
• Method 							C											I	I
• Play 								C											
• Act 								P	C	C	C								





<ul style="list-style-type: none"> Activity Structure  	IP	IP	IP	IP	IP					C,P	C,P	C,P	C,P					I			
<ul style="list-style-type: none"> Learning Activity  	IP	IP	IP	IP	IP					P	P	P	P					I	I	I	
<ul style="list-style-type: none"> Support Activity  	IP	IP	IP	IP	IP					P,A	P,A	P,A		A				I	I	I	
<ul style="list-style-type: none"> External Unit of learning  										P	P	P	P								

Table 2 : Procedure














































Destination	Generic																Instance			
From	Concept					Procedure							Principle				Fact			
																				
Principle																				
<div><div>● Learning role</div></div>									R	R	R	R	C				I			
<div><div>● Staff role</div></div>										R	R	R	R	A	C		I			
<div><div>● Number of select</div></div>									R											
<div><div>● Time Limit</div></div>						R	R	R	R	R	R	R								

Table 3 : Principle

Destination	Generic														Instance					
From	Concept					Procedure							Principle				Fact			
																				
Fact																				
● Item 																				
● Learning Objectives 																				

• Prerequisites <input type="checkbox"/>																				
• Metadata <input type="checkbox"/>	A	A	A	A	A	A	A	A	A	A	A							A	A	A

Table 4 : Fact


15.5.1 Grammar Rule Exceptions (Educational)

The Grammar Rules are defined in *Knowledge Modelling Technique*. However, MotPlus allows certain exceptions.

- When you create a Link that does not abide by the Grammar Rules and there are no other alternatives, MotPlus enables you to generate an Undefined Link.
- Upon creation, Undefined Links go immediately into Text Edit mode. You can then immediately identify your Link according to your needs.

15.6 Selecting Graphic Objects (Educational)

Selecting is a basic function of all actions involving graphic objects, including moving, copying, deleting, editing, and displaying the Lower Model This section describes how to select one or more graphic objects and how to resize the Knowledge Unit and Comment objects.

Clicking on the  button on the Editing Toolbar activates the Select command mode. It is automatically activated when you perform any equivalent action, e.g. clicking on an object on the model background.

- **To select a graphic object**, just click on the desired object.
- **To select a group of graphic objects**, point to the model window background and, while pressing the left mouse button move the mouse drawing a box encompassing all the objects to be selected. Release the mouse button.

15.7 Moving Graphic Objects (Educational)

It is sometimes useful to distribute the various graphic objects in such a way as to illustrate the model more clearly. In this section, we will show you how to move one or more Knowledge Units or Comments, change the source and destination of a link or modify its curve.

- **To move one or more Knowledge Units or Comments**, select the desired object(s), point to the selection and drag and drop it onto the selected location.
- **To change the source or destination of a link**, select the link and drag and drop the appropriate handle onto the desired Knowledge Unit.

To invert a link, go to the **Link** submenu of the right click popup menu shown when pointing to the Link, and

click on **Invert Link**.

- To change a Link's curve, select a link and drag the centre handle until the link has the desired curve.

15.8 Labels (Educational)

The Educational model enables you to create or delete a wide variety of preselected labels.

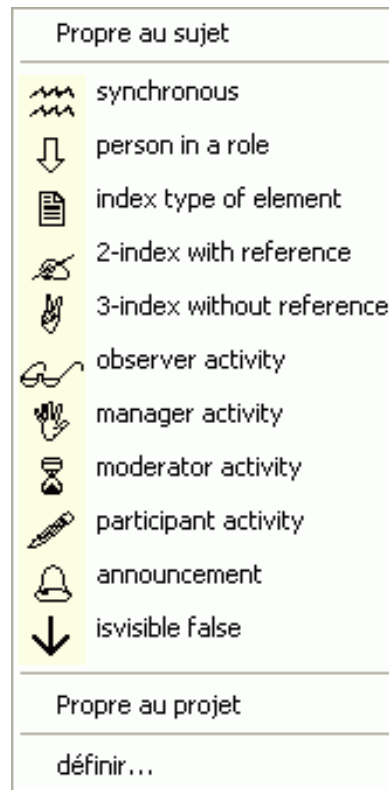


Figure1 : Labels list

- Learning ou Support activity
 - *manager activity*
 - *observer activity*
 - *participant activity*
 - *moderator activity*
- Play, Learning Activity, Support Activity, Learning Object, ou Item
 - *Isvisible true (default when symbol is created) = No label*
 - *Isvisible false*
- Send Mail
 - *All persons in a role (default when Send Mail symbol is created) = No label*
 - *Person in a role*
- Index Search
 - *Index class (default when Index Search symbol is created) = No label*
 - *Index type of element*
 - *1- free text search (default when Index Search symbol is created) = No label*
 - *2- index with reference*

- 3- *index without reference*
- Conference
 - 1- *Synchronous*
 - 2- *Asynchronous (default when Conference symbol is created) = No label*
 - 3- *Announcement*

See :

<http://www.imsglobal.org/learningdesign/index.html>

[16. Basic Functions \(Ontology\)](#)

- [16.1 Choose the Type of Model \(Ontology\)](#)
- [16.2 Creating and Editing Graphic Objects \(Ontology\)](#)
- [16.3 Types of links](#)
- [16.4 Creating Link \(Ontology\)](#)
- [16.5 Selecting Graphic Objects \(Ontology\)](#)
- [16.6 Moving Graphic Objects \(Ontology\)](#)
- [16.7 Labels \(Ontology\)](#)

16. Basic Functions (Ontology)

Under Construction

This chapter explains MotPlus' basic functions that you will use to create Ontology OWL Knowledge Models.

OWL provides three increasingly expressive sublanguages designed for use by specific communities of implementers and users.

- **OWL Lite** supports those users primarily needing a classification hierarchy and simple constraints. For example, while it supports cardinality constraints, it only permits cardinality values of 0 or 1. It should be simpler to provide tool support for OWL Lite than its more expressive relatives, and OWL Lite provides a quick migration path for thesauri and other taxonomies. Owl Lite also has a lower formal complexity than OWL DL..
- **OWL DL** supports those users who want the maximum expressiveness while retaining computational completeness (all conclusions are guaranteed to be computable) and decidability (all computations will finish in finite time). OWL DL includes all OWL language constructs, but they can be used only under certain restrictions (for example, while a class may be a subclass of many classes, a class cannot be an instance of another class). OWL DL is so named due to its correspondence with description logics, a field of research that has studied the logics that form the formal foundation of OWL.
- **OWL Full** is meant for users who want maximum expressiveness and the syntactic freedom of RDF with no computational guarantees. For example, in OWL Full a class can be treated simultaneously as a collection of individuals and as an individual in its own right. OWL Full allows an ontology to augment the meaning of the pre-defined (RDF or OWL) vocabulary. It is unlikely that any reasoning software will be able to support complete reasoning for every feature of OWL Full.

Each of these sublanguages is an extension of its simpler predecessor, both in what can be legally expressed and in what can be validly concluded. The following set of relations hold. Their inverses do not.

- Every legal OWL Lite ontology is a legal OWL DL ontology.
- Every legal OWL DL ontology is a legal OWL Full ontology.
- Every valid OWL Lite conclusion is a valid OWL DL conclusion.
- Every valid OWL DL conclusion is a valid OWL Full conclusion.

Ontology developers adopting OWL should consider which sublanguage best suits their needs. The choice between OWL Lite and OWL DL depends on the extent to which users require the more-expressive constructs provided by OWL DL. The choice between OWL DL and OWL Full mainly depends on the extent to which users require the meta-modeling facilities of RDF Schema (e.g. defining classes of classes, or attaching properties to classes). When using OWL Full as compared to OWL DL, reasoning support is less predictable since complete OWL Full implementations do not currently exist.

OWL Full can be viewed as an extension of RDF, while OWL Lite and OWL DL can be viewed as extensions of a restricted view of RDF. Every OWL (Lite, DL, Full) document is an RDF document, and every RDF document is an OWL Full document, but only some RDF documents will be a legal OWL Lite or OWL DL document. Because of this, some care has to be taken when a user wants to migrate an RDF document to OWL. When the expressiveness of OWL DL or OWL Lite is deemed appropriate, some precautions have to be taken to ensure that the original RDF document complies with the additional constraints imposed by OWL DL and OWL Lite. Among others, every URI that is used as a class name must be explicitly asserted to be of type owl:Class (and similarly for properties), every individual must be asserted to belong to at least one class (even if only owl:Thing), the URI's used for classes, properties and individuals must be mutually disjoint.

16.1 Choose the Type of Model (Ontology)

We must stress that choosing the type of model is a way to begin Modelling by adopting, at the very outset, a specific point of view on the concept being studied. This choice is important, since it determines the type of the Principal Knowledge Units and their Links.

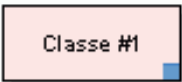
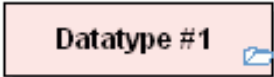
The **Ontology** command on the **Model Type** menu enables you to create a Ontology graphic objects.
















Note : The objects not-specific to the Ontology model will be destroyed.

















16.2 Creating and Editing Graphic Objects (Ontology)










MotPlus helps users to create graphic objects representing the tree types of knowledge (**Concept, Principle, Fact**) defined in *Knowledge Modelling Technique*. According to *Knowledge Modelling Technique*, this type can be associated to an object, such as a Skill, Learning Unit or Instrument, that links the current model to another knowledge domain through its associated Lower Model.

The list of OWL language constructs is given below.




Concept	Exemple
• Classe	
• Datatype (primitive/derived)	



string		string #1 
	<i>normalizedString</i>	normalizedString #1 
	<i>token</i>	token #1 
	<i>Language</i>	language #1 
	<i>IDREFS</i>	IDREFS #1 
	<i>ENTITIES (entités)</i>	ENTITIES #1 
	<i>NMTOKEN</i>	NMTOKEN #1 
	<i>NMTOKENS</i>	NMTOKENS #1 
	<i>Name</i>	Name #1 
	<i>NCName</i>	NCName #1 
	<i>ID</i>	ID #1 
	<i>IDREF</i>	IDREF #1 
	<i>ENTITY</i>	ENTITY #1 
boolean		boolean #1 
float		float #1 

double		double #1 
decimal		decimal #1 
	<i>Integer</i>	Integer #1 
	<i>nonPositiveInteger</i>	nonPositiveInteger #1 
	<i>negativeInteger</i>	negativeInteger #1 
	<i>long</i>	long #1 
	<i>int</i>	int #1 
	<i>short</i>	short #1 
	<i>byte</i>	byte #1 
	<i>nonNegativeInteger</i>	nonNegativeInteger #1 
	<i>unsignedLong</i>	unsignedLong #1 
	<i>unsignedInt</i>	unsignedInt #1 
	<i>unsignedShort</i>	unsignedShort #1 
	<i>unsignedByte</i>	unsignedByte #1 
	<i>positiveInteger</i>	positiveInteger #1 
duration		duration #1 

dateTime		dateTime #1 
time		time #1 
date		date #1 
gYearMonth		gYearMonth #1 
gYear		gYear #1 
gMonthDay		gMonthDay #1 
gDay		gDay #1 
gMonth		gMonth #1 
hexBinary		hexBinary #1 
base64Binary		base64Binary #1 
anyURI		anyURI #1 
QName		QName #1 
NOTATION		NOTATION #1 







Principle

• Property		Property #1 
• Cardinalité		Cardinality #1 
• Cardinalité min.		Cardinality min. #1 

• Cardinalité max.	
Fact	
• Individual	

16.2.1 Creating Graphic Objects (Ontology)

Building a Knowledge Model essentially consists in creating, naming and linking various types of knowledge units in order to represent the user's perception of a specific domain of knowledge. One of the main actions is therefore to create the graphic objects (Knowledge Units and Links) required to illustrate the user's perception. If necessary, you can add Comments to your models. To create a graphic object, you proceed as follows:

- On the Editing Toolbar, click on the button showing the desired type of object among the following:
Concept  ; **Principle**  ; **Datatype**  ; **Fact**  ; **Link**  ; **Comment** .
- To create **Concept**, **Principle**, **Datatype** and **Fact** objects, position the cursor in the model window wherever you wish to create the object. While pressing on the left mouse button, move the cursor until the object is the desired size. Release the mouse button. The object is in text editing mode. If applicable, enter the name of the new object. By right clicking on the Concept, Principle, Datatype and Fact button in the toolbar, you will open a menu listing the various types of concept, principle, datatype or fact you can create. Click on the desired type of concept, principle, datatype or fact.
- To create a Comment** related to the model, Knowledge Unit or Knowledge Unit Link.

If, at the outset, the mouse cursor is pointing to the model background, the Comment will relate to the model as a whole. While holding down the left mouse button, move the mouse to form a box big enough to hold your Comment. Release the mouse button. You can then enter your Comment text. When the Comment is selected, an arrow's head faces the centre right handle (when pointing to the arrow handle with the mouse, the cursor changes into crossed double arrows). If necessary, you can associate this Comment to a Knowledge Unit or Link by dragging the arrow's head to the related Knowledge Unit or Link.

If, at the outset, the mouse is pointing to a Knowledge Unit or Link, the new Comment will be directly related to that Knowledge Unit or Link. While holding down the left mouse button, move the mouse and release the button wherever you wish to insert your Comment. A box appears related to the Knowledge Unit or Link where you may enter your Comment text. If necessary, the Comment can be linked to another Knowledge Unit, Knowledge Unit Link or the Knowledge Model itself by dragging the arrow's link.

16.3 Types of links

In MotPlus, the various Ontology types of knowledge can be joined using six types of links (**Composition**,

Regulation, Specialisation, Equivalent, Inverse, Complement, Disjoint, Identical and Diffent) according to the principles described in *Knowledge Modelling Technique*. There can be single (C) or multiple (C*) Composition Links between two Knowledge Units. When there are multiple links, Knowledge Unit A is composed of many examples of Knowledge Unit B rather than just one. The Multiple Composition Link is identified by the 'C*' tag.

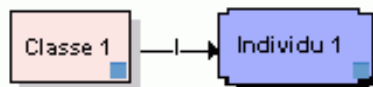
MotPlus has an extra **Untyped Link** to which you can give whatever name suits your purpose. For example, this Link can join a Skill to its related Knowledge Units.

In MotPlus, all these elements are considered graphic objects and any Modelling process must necessarily begin with learning the basic valid actions that may be performed on or with these graphic objects. We will now describe in detail the valid actions that may be performed in MotPlus:

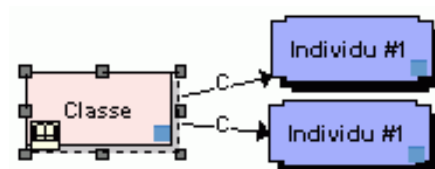
16.3.1 Suggestions on How to Use Knowledge Units and Links (Ontology)

Here are some suggestions related to specific Modelling situations.

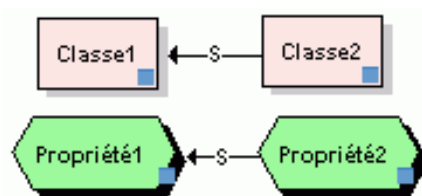
- If appropriate, join the Concept using an I link to a Fact -type Knowledge Unit indicating the name of the person.



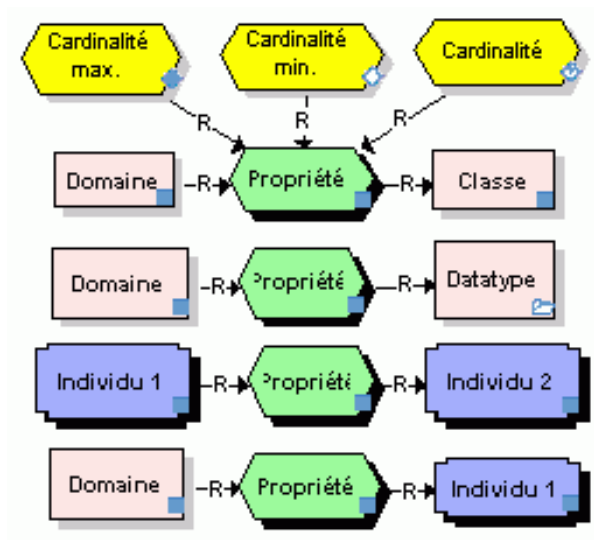
- **To Illustrate a Knowledge Unit using its components**, use C links from this Knowledge Unit to each of its component Knowledge Units.



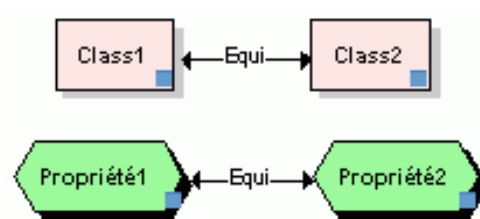
- **To Illustrate a Knowledge Unit using its categories**, use S links from the category Knowledge Units to the described Knowledge Unit.



According to the **Grammar Rules** defined in *Knowledge Modelling Technique*, the only direct Link permitted between these two types of knowledge units is a **Regulation Link** (R link).



- Two classes may be stated to be equivalent. **Equivalent** classes have the same instances. Equality can be used to create synonymous classes.



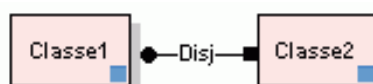
- One property may be stated to be the **Inverse** of another property.



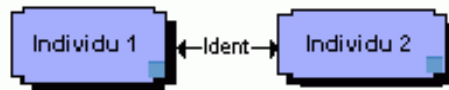
- The **Complement** construct selects all individuals from the domain of discourse that do not belong to a certain class.



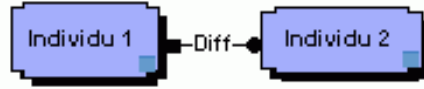
- Classes may be stated to be **Disjoint** from each other.



- This mechanism is similar to that for classes, but declares two individuals to be **Identical**.



- An individual may be stated to be **Different** from other individuals.




16.4 Creating Link (Ontology)

From Links : to create a Factual Knowledge Unit unrelated to any Knowledge Unit. Its nature will be defined by the type of Knowledge Unit to which it is eventually linked.


The lower right corner of such a type of fact has no tag.

See also *Changing the Type of an Existing Knowledge Unit or Link*.

- **To create another object of the same type**, repeat the preceding step. The same button remains selected until you click on another command, so you can keep creating more objects of the same type.
- **To create a link between two Knowledge Units**, click on the  button and select one of the two following procedures.
In the model window, click on the source Knowledge Unit and drag and drop the link head on the destination Knowledge Unit.









The system then creates the type of link selected in accordance with the integrated (knowledge relationship) Grammar Rules. If valid, the Composition Link is chosen by default.

- By right clicking on the  button in the toolbar, you will open a menu listing the various types of links

you can create. Click on the desired type of link and follow the previously explained procedure.

16.4.1 Table of Grammar Rules (Ontology)

The following Table summarises the valid Links between the various pairs of Knowledge Units.

Destination	Abstract Knowledge									
Origine	Concept	Datatype	Principle						Fact	
Nom de l'objet	Concept		Principle						Fact	
Concept										
•  <i>Class</i>		S Equi Comp Disj		R						I, C
•  <i>Datatype</i>										I
Principle										
•  <i>Property</i>		R	R		S Equi Inv					R
•  <i>Cardinality</i>					R					
•  <i>Cardinality min.</i>					R					
• <i>Cardinality max.</i>					R					
Fact										
•  <i>Individual</i>					R					Ident Diff

Refer to **Knowledge Modelling Technique** for more information about the Grammar Rules governing the linking of different types of knowledge units.

16.4.2 Grammar Rule Exceptions (Ontology)


The Grammar Rules are defined in *Knowledge Modelling Technique*. However, MotPlus allows certain exceptions.

- When you create a Link that does not abide by the Grammar Rules and there are no other alternatives, MotPlus enables you to generate an Undefined Link.
- Upon creation, Undefined Links go immediately into Text Edit mode. You can then immediately

identify your Link according to your needs.

16.5 Selecting Graphic Objects (Ontology)

Selecting is a basic function of all actions involving graphic objects, including moving, copying, deleting, editing, and displaying the Lower Model This section describes how to select one or more graphic objects and how to resize the Knowledge Unit and Comment objects.

Clicking on the  button on the Editing Toolbar activates the Select command mode. It is automatically activated when you perform any equivalent action, e.g. clicking on an object on the model background.

- **To select a graphic object**, just click on the desired object.
- **To select a group of graphic objects**, point to the model window background and, while pressing the left mouse button move the mouse drawing a box encompassing all the objects to be selected. Release the mouse button.

16.6 Moving Graphic Objects (Ontology)

It is sometimes useful to distribute the various graphic objects in such a way as to illustrate the model more clearly. In this section, we will show you how to move one or more Knowledge Units or Comments, change the source and destination of a link or modify its curve.

- **To move one or more Knowledge Units or Comments**, select the desired object(s), point to the selection and drag and drop it onto the selected location.
- **To change the source or destination of a link**, select the link and drag and drop the appropriate handle onto the desired Knowledge Unit.



To invert a link, go to the **Link** submenu of the right click popup menu shown when pointing to the Link, and click on **Invert**.









See also *Moved or Copied Link's Name Changes*.

- **To change a Link's curve**, select a link and drag the centre handle until the link has the desired curve.

16.7 Labels (Ontology)

The Ontology model enables you to create or delete a wide variety of preselected labels.

Class		
	Class collection “All different individuals“	
	Class Collection “One of”	

	Class Collection “Union of”	
	Class Collection “Intersection of”	
Property		
	<i>Symetric</i>	
	<i>Transitive</i>	
	<i>Functional</i>	
	Inverse Functional	
	AllValuesFrom	
	someValuesFrom	

See :

OWL Web Ontology Language Overview (W3C Recommendation 10 February 2004)

<http://www.w3.org/TR/2004/REC-owl-features-20040210/>

OWL Web Ontology Language Guide (W3C Recommendation 10 February 2004)

<http://www.w3.org/TR/owl-guide/>

OWL Web Ontology Language Reference (W3C Recommendation 10 February 2004)

<http://www.w3.org/TR/2004/REC-owl-ref-20040210/>

OWL Web Ontology Language - Parsing OWL in RDF/XML (W3C Working Group Note 21 January 2004)

<http://www.w3.org/TR/2004/NOTE-owl-parsing-20040121/>

17 RECOMMENDATIONS

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17 RECOMMENDATIONS

17.1 RECOMMENDATIONS ON THE USE OF Untyped KNOWLEDGE UNITS AND LINKS

- Use Untyped Knowledge Units (Standard) mostly to add complementary descriptive elements to the Knowledge Model. You can then filter out this type of Knowledge Unit without affecting the essential part of the knowledge domain's representation.
- Use the Untyped type to associate Knowledge Units (Standard) (e.g. Skill, Learning Unit, Instrument) from other knowledge domains.
For example, the model into which the Untyped Knowledge Unit is integrated illustrates a particular knowledge domain. On the other hand,...
 - ... a Skill's Lower Model describes the domain studying the knowledge.
 - ...a Learning Unit's Lower Model describes the instructional domain.
 - ... an Instrument's Lower Model describes the learning material production domain.
- Use the Untyped type (Standard) to illustrate the transfer of Knowledge Units from a known domain of application to another domain.
For example, an Untyped Knowledge Unit's Lower Model illustrating a mathematical formula can serve to link a model describing a physical domain phenomenon.
- When joining Untyped Knowledge Units (Standard), as a rule, use Untyped Links.
To make models easier to understand and compare, we recommend you abide by the defined Grammar Rules and use this type of link only for joining Untyped Knowledge Units to other types of knowledge units. MotPlus enables you to specify, as needed, the name of this type of link.
- Use the Untyped Knowledge Units and Links (Standard) to suit your needs, mainly when using MotPlus for other types of Modelling.
For example, you can use them to model learning events or learning scenarios.
- You could even use an Untyped Knowledge Unit (Standard) to create a round-cornered frame.
- Knowledge Modelling Technique suggests using Comments to specify learning needs related to a model's Principal Knowledge Units.
Learning needs are defined as a scale of competency (conceptual meta-knowledge).
- Also consider inserting OLE documents in Comment-type objects linked to the Knowledge Units.

17.2 DIFFERENCE BETWEEN THE ATTACH OLE DOCUMENT, INSERTING OBJECT AND COPY REFERENCE COMMANDS

- All three commands serve to insert a file from another application into a MotPlus document. The file is linked by an OLE link. However, each of these commands has its own specific functions.
The Attach OLE Document command (see Attaching an OLE Document to a Model, Knowledge Unit or Comment) is only active when a Knowledge Unit or Comment is selected.
Mainly use this command when you wish to attach a new or existing OLE document from one of the OLE-capable applications listed.
- The Insert Object (see Attaching an OLE Document to a Model, Knowledge Unit or Comment, command has a different effect depending on the insertion point defined by the mouse pointer. If the insertion point is a Knowledge Unit or Comment, its action is the same as Attach OLE Document.
Mainly use this command when you wish to attach to a MotPlus Model a new or existing OLE document from one of the OLE-capable applications listed.
- The effect of the Paste Reference command (see Attaching an OLE Document to a Model, Knowledge Unit or Comment) depends on the source of the clipboard's content and the point of insertion defined by the mouse pointer.
- Mainly use this command when you want the attached OLE document to contain whatever is in the clipboard. The attached document's type of application is, by default, the same as that of the source of the clipboard's content.

17.3 DIFFERENCE BETWEEN THE CUT, CLEAR AND DESTROY COMMANDS

- As far as display is concerned, the Cut command is similar to the Delete command (see Clearing Graphic Object). The selected graphic objects disappear from the displayed model; the difference is that, in the case of Cut, the objects are transferred to the clipboard.
See also How to Avoid Losing Lower Models.
- With the Destroy command, the selected graphic objects disappear only from the displayed model. The copies of these objects (whether they are referenced or not) that were previously pasted in any other models of the document are not deleted from their respective models.
- With the Destroy command (see Destroying Graphic Objects), selected Referenced Knowledge Units are deleted from all models in the document where they were pasted. But any unreferenced graphic objects that are selected disappear only from the displayed model. This means that their copies previously pasted in any other models of the document are not deleted from their respective models.

17.4 DIFFERENCE BETWEEN THE OPEN LOWER/UPPER MODEL COMMANDS

- In fact, these commands enable easy navigation among the various levels of the document. The Open Lower Model command opens a new model window of the same document. This new window displays the selected Knowledge Unit's Lower Model.
- The Open Upper Model command opens a new model window of the same document. This new window shows the parent of the displayed Lower Model.
- These commands serve to open another window to enable you to view and edit two models of the same document. To display both models simultaneously, click on Cascade or Tile. You can then compare the models, transfer Knowledge Units from one to the other or just edit them. When many model windows are opened at once, MotPlus commands only affect the active window.

17.5 HOW TO AVOID LOSING LOWER MODELS

Two conditions related to Windows® standards may potentially lead to the loss of a model in a MotPlus document:

1. In MotPlus, the function of the Cut command follows the principles defined for Windows® applications. Therefore, selected graphic objects are removed from the displayed model and transferred to the clipboard. This command also transfers any Lower Models associated to the cut Knowledge Units. ATTENTION: Do not forget that the clipboard is shared by all applications. If you replace the cut Knowledge Unit in the clipboard by different content, its associated Lower Models will also be lost. To avoid losing Lower Models, we recommend you click on Paste Reference immediately to retrieve the content of the clipboard (see Copying/Pasting Knowledge Units with their Reference).
2. In MotPlus, the function of the Paste command follows the principles defined for Windows® applications. Therefore, selected graphic objects are overwritten by the content of the clipboard. If the selected Knowledge Units have associated Lower Models, these will also be automatically deleted from the displayed model. ATTENTION: As per Windows® standards, you must check for yourself to make sure that you truly wish to overwrite not only the selected Knowledge Unit but also its Lower Models in the displayed model.

17.6 TIPS ON HOW TO USE THE GRAPHIC ATTRIBUTES FOR EFFECT

MotPlus provides many ways to modify the graphic attributes. For example, you can change the following attributes:

- The Knowledge Units' pattern as well as the colour of the pattern itself and its background.

- The style and color of the border used to draw Knowledge Units.
The character font, style, size and color of the text used to identify the Knowledge Units.
- The style, colour and shape of the lines used to draw the Links.
- The color of the model background.
You may wish to modify certain attributes for some of the following reasons:
 - Visually enhance or refine you models.
 - Emphasize the Principal Knowledge Unit.
 - Emphasize important Knowledge Units or Links.
For example, you can make it easier to spot Knowledge Units that were pasted in two different places in the same model.
 - Emphasize a particular type of Knowledge Unit.
For example, you could use a specific color to differentiate Input Concepts from Product Concepts in a process.
 - Categorize sub-types of knowledge units.
For example, by using a different color and/or style of border, you could identify the various categories of Concepts in terms of their importance in the model, e.g. primary, secondary, or tertiary.

The following are a few practical applications of using graphic attributes for effect:

17.6.1 Adding a Model Title

To create a framed title, you could use a Concept type of Knowledge Unit.
You can also go to the Graphic Attributes dialogue box to remove the shadow and/or select the appropriate background color or border. You can also change the text attributes to make the title stand out.

Using an Untyped type of Knowledge Unit (Standard) offers the advantage of enabling you to filter the title out of the model without affecting its other Knowledge Units.
For a title without a frame, use any type of Knowledge Unit (preferably Untyped).
However, in this case, you select 'Transparent' for the background and border. You can also change the text attributes to distinguish the title from the text in the model's Knowledge Units.

17.6.2 Framing Models

- To frame your model, you could create a Concept Knowledge Unit.
- Delete the Knowledge Unit's label.
- Position the Knowledge Unit and adjust its size as desired.
- Send it to the back, behind all other graphic objects.
- In the Graphic Attributes dialogue box, remove the shadow or select the appropriate background color or border.

17.6.3 Adding Legends to Models

- Use any appropriate type of object to create a legend.
- Label your objects or not.

- Position and adjust the size of the objects. Use, if appropriate, the object overlay adjustment commands.
- Modify the graphic attributes of each object as needed.
If necessary, group objects together.
- Here is an example of a legend that might be added to a model:
- The figure on the left illustrates all the objects (broken lines) used to make up the legend. In this example, only Untyped objects were used.
- The figure on the right illustrates the completed legend with grouped objects.

17.7 TROUBLESHOOTING PRINTING PROBLEMS

Your model prints over several pages:

Activate the Print Models on one Page option in the Print dialogue box (see Description of the Print Dialog Box).

Your model is overcrowded or the names of the Knowledge Units and Links are hard to read:

Consider one or more of the following solutions.

- If the page orientation is 'Portrait', change it to 'Landscape'.
- Reduce the number of Knowledge Units and Links in your model.
- Transfer the Ancillary Knowledge Units to Lower Models keeping only the Principal Knowledge Units in the model to be printed.
- Use filters to eliminate certain types of knowledge units and Links.
- Mark as hidden the Links you consider less important.
- If appropriate, filter out Comments.
- Reposition the model's Knowledge Units.
- When the Print Models on one Page option is checked (see Description of the Print Dialog Box), you can optimize the print size of the model by moving the Knowledge Units closer together. To save space, you can also shrink each Knowledge Unit as much as possible.
- If 'Landscape' is selected as the page orientation, click on Fit Model in Window (see Optimising the Display of the Whole Model, Page 31) and optimize the distance between Knowledge Units within the model window.
- If the 'Portrait' page orientation was selected: select Page Grid; adjust the Zoom to 75%; center one of the grid boxes in the window; and optimize the layout of the model's
- Distribute the model's Knowledge Units over several print pages.
- Deactivate the Print Models on one Page option in the Print dialogue box. Select Page Grid and distribute the model's Knowledge Units in the grid boxes. The Knowledge Units will be printed according to their size and distribution on the grid.

The order of the print pages does not follow the model's hierarchical structure:

Number the Principal Knowledge Units of each of the Lower Models according to the hierarchical structure of the document's models or the desired print order of the models.

When the Main Model is part of the Print Range, it is always printed first.

The text of one or more objects is cut when printed:

Consider one or more of the following solutions.

- Change the shape or increase the size of the objects to include the entire text.
 - Decrease the font size until all the text's characters are visible.
- Check the results of your changes in the Print Preview window.

Appendix 1: List of Keyboard Shortcuts

In Alphabetical Order of the Commands

COMMAND	SHORTCUT	MENU	MODE
Go to Lower Model	Enter	View	graphic
Go to Upper Model	Backspace	View	graphic
Send to Back	Ctrl + - (on keypad)	Layout	graphic
Send to Front	Ctrl + + (on keypad)	Layout	graphic
Undo	Ctrl + Z	Edit	text and graphic
Paste	Ctrl + V	Edit	text and graphic
Copy	Ctrl + C	Edit	text and graphic
Cut	Ctrl + X	Edit	text and graphic
Ungroup	Ctrl + U	Layout	graphic
Send Backward	- (on keypad)	Layout	graphic
Send Forward	+ (on keypad)	Layout	graphic
Delete	Del	Edit	text and graphic
Save	Ctrl + S	File	text and graphic
Group	Ctrl + G	Layout	graphic
Print	Ctrl + P	File	text and graphic
New Graphic Document	Ctrl + N	File	text and graphic
Open	Ctrl + O	File	text and graphic
Open Lower Model	Ctrl + Enter	View	graphic
Open Upper Model	Ctrl + Backspace	View	graphic
Object Properties	Alt + Enter	Edit	text and graphic
Next Reference	Alt + R	View	graphic
Redo	Ctrl + R	Edit	text and graphic
Select All	Ctrl + A	Edit	text and graphic
Fit Model in Window	Alt + A	View	graphic

By Type of Shortcut

SHORTCUT	COMMAND	MENU	MODE
- (on keypad)	Send Backward	Layout	graphic
+ (on keypad)	Send Forward	Layout	graphic
Enter	Go to Lower Model	View	graphic

Del	Delete	Edit	text and graphic
Backspace	Go to Upper Model	View	graphic
Alt + Enter	Object Properties	Edit	text and graphic
Alt + R	Next Reference	View	graphic
Alt + A	Fit Model in Window	View	graphic
Alt + N	Insert Neighbors	Edit	graphic
Ctrl + - (on keypad)	Send to Back	Layout	graphic
Ctrl + + (on keypad)	Send to Front	Layout	graphic
Ctrl + A	Select All	Edit	text and graphic
Ctrl + Backspace	Open Upper Model	View	graphic
Ctrl + C	Copy	Edit	text and graphic
Ctrl + Enter	Open Lower Model	View	graphic
Ctrl + G	Group	Layout	graphic
Ctrl + N	New Graphic Document	File	text and graphic
Ctrl + O	Open	File	text and graphic
Ctrl + P	Print	File	text and graphic
Ctrl + R	Redo	Edit	text and graphic
Ctrl + S	Save	File	text and graphic
Ctrl + U	Ungroup	Layout	graphic
Ctrl + V	Paste	Edit	text and graphic
Ctrl + X	Cut	Edit	text and graphic
Ctrl + Z	Undo	Edit	text and graphic