IPTS-TIM© V.1.1

Software

«A tool to help experts evaluate the marketability potential of new technologies»

User's Manual and Tutorial

USER's MANUAL and TUTORIAL

Technology Identification Methodology

IPTS-TIM© - Software **V.1.1**

«A tool to help experts evaluate the marketability potential of new technologies»

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IPTS-TIM© Software V1.1 - User's Manual

1. Introduction

IPTS-TIM constitutes an innovative user-friendly software tool which aims to assist members of the technology assessment team, scientists, technology based organisations or stake-holders in increasing their awareness on market related issues, by upgrading skills and information. This tool aids in the characterisation of aims and results from RTD projects, independently of their stage of implementation, especially under the European perspective.

IPTS-TIM can be used as an instrument to guide the appraisal of the marketability potential of new technologies not commercialised yet in a given market/segment.

The software would assist, for example, in structuring project portfolios, establishing transparent linkages between projects and technology marketability, orientating project reporting towards relevant and critical issues, in order to provide technology evaluations with the necessary information base. Simultaneously, the software can produce relevant inputs to more refined evaluations at the supplier / final user level (e.g. portfolio balance, clustering of technologies analysis).

IPTS-TIM takes into account the relevant aspects involved in a technological project in order to reach a final conclusion aimed at providing an objective evaluation of the economic and social benefits expected from the results of the technology development. The information is collected through four modules that arrange and select external and internal information and process it through three additional modules to provide clear conclusions that facilitate decision-making. In addition, ***IPTS-TIM*** allows to:

define a technology's characteristic, and by way of a questionnaire to define its importance against marketability potential

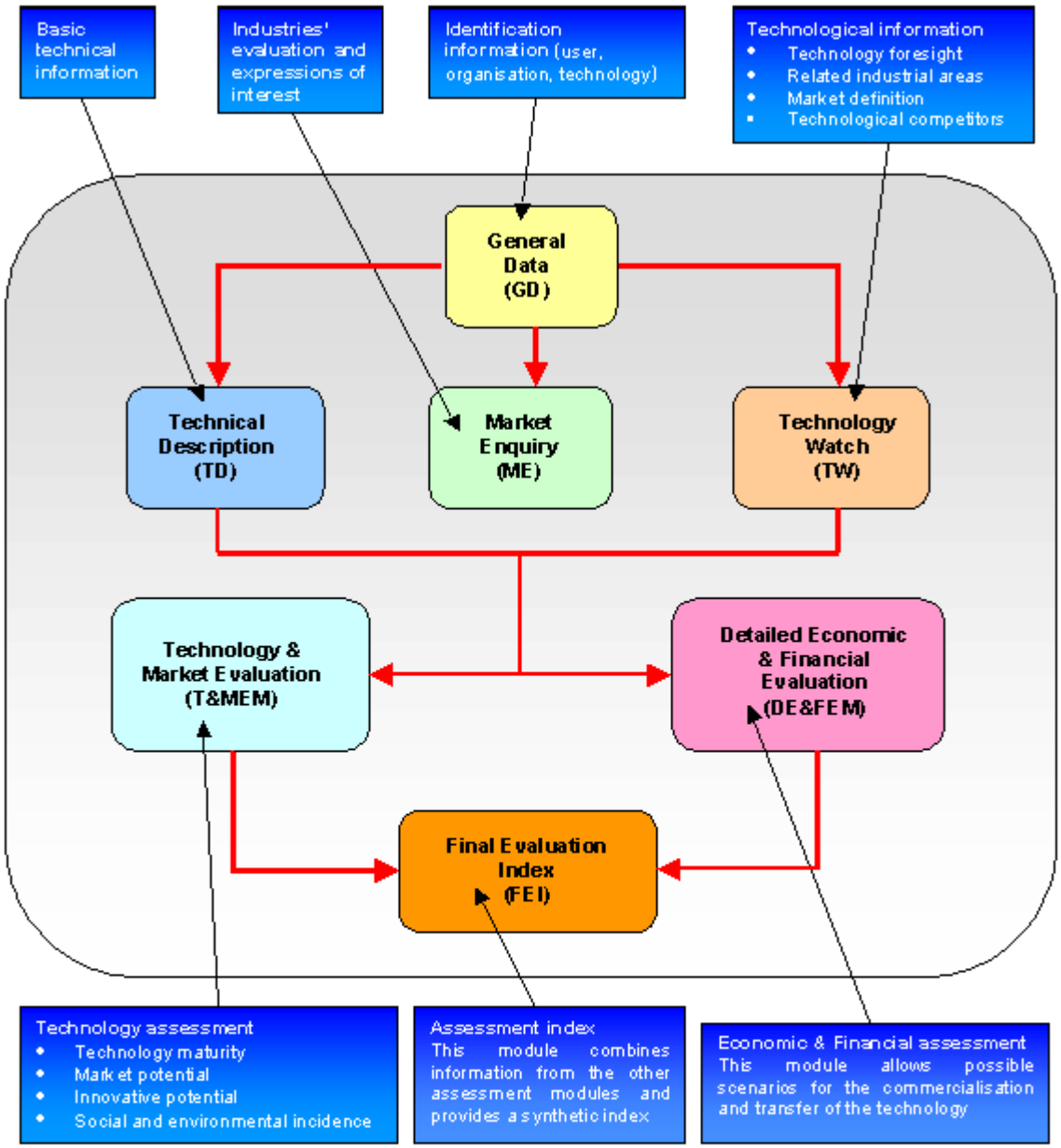
compare various technologies according to pre-selected criteria and to classify each of them according to the possibility of its implementation

perform project comparisons using graphics.

The basic set up of ***IPTS-TIM*** model consists of 7 modules. The **General Data (GD)** and the **Technology Description (TD)** modules complement each other collecting and processing all the basic information available at the Organisation/Department level concerning the technology that is going to be evaluated. The **Market Enquiry (ME)**, provides the compiled results obtained through a survey questionnaire to benefit the evaluation process, of appraisal from commercial bodies of the market potential of the targeted technology. The **Technology Watch (TW)** module provides a systematic and structured procedure to retrieve and process supportive detailed background and prospective information on the technology under analysis, and on the industrial areas in which it might be applied. The information provided in this module uses database and bibliographic sources, in conjunction with the analysis of available foresight studies and European Union R&D and relevant industrial policies and programmes.

The **Technology and Market Evaluation (T&MEM)** module provides a mechanism to prioritise and rank the technologies. The T&ME, relying heavily on the qualitative

results derived from the TD, TW and ME modules, provides as an outcome a weighted average of 20 factor scores attained in four main evaluation criteria categories (Development level, Innovative Potential, Market Potential, Strategic Importance) by each of the technologies. Depending on the expert/objective of the organisation the weights can be modified accordingly, following the recommendations (eigenvector method) supplied. The **Detailed Economic and Financial Evaluation (DE&FEM)** module allows to define for each technological investment project a royalty rate and a licensing fee (including net present value, return on investment and other economic and financial parameters). The **Final Evaluation Index (FEI)** module, after structuring and processing all the information, allows to combine, in the form of a synthetic index, the qualitative and quantitative outputs from T&ME and DE&FEM modules.



IPTS-TIM*© *Model & Software

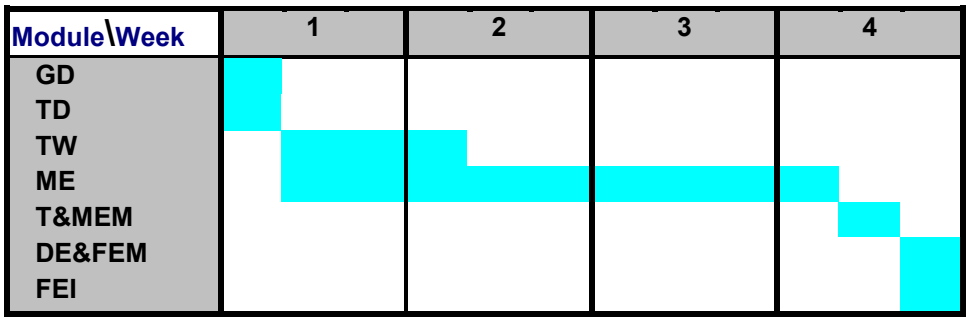
2. Operation and Modularity

The ***IPTS-TIM*** constitutes a fully integrated and compatible software package made up of different complementary and interconnected modules. The development approach for ***IPTS-TIM*** permits an independent operation of each of its modules. This characteristic provides the user with the required flexibility needed in technology related project evaluation.

The accuracy of the results provided by ***IPTS-TIM*** are highly dependent on the user skills/knowledge of the technology being evaluated and on the level of detail of the information fed into the system.

The time necessary to finish the evaluation through ***IPTS-TIM*** varies considerably from 1 hr. to 4 weeks, depending on how many evaluation modules the expert uses, how much information is fed in and how much the expert is familiar with the software.

The estimated time it takes to evaluate a given technology by using all the modules of the ***IPTS-TIM***© software tool is 4 weeks, e.g., as following:



This estimate would apply in the case of starting the evaluation with very little information on the new technology (and its potential market), and when exhaustive information is searched and used during the evaluation.
Note that the market enquiry (ME) questionnaire can be sent to the targeted organizations in electronic form (ACCESS database) by e-mail.

3. Minimum PC requirements

IPTS-TIM is developed in Visual Basic 6.0 for operation under Windows 95, Windows 98 and Windows NT, and uses ACCESS database.
The minimum requirements to install IPTS-TIM are the following:

- Display: 800 x 600 VGA resolution.
- Processor: CPU 486
- Memory: 32 Mb RAM
- Operating system: Windows 95/98/NT
- HDD: 15 Mb. free.

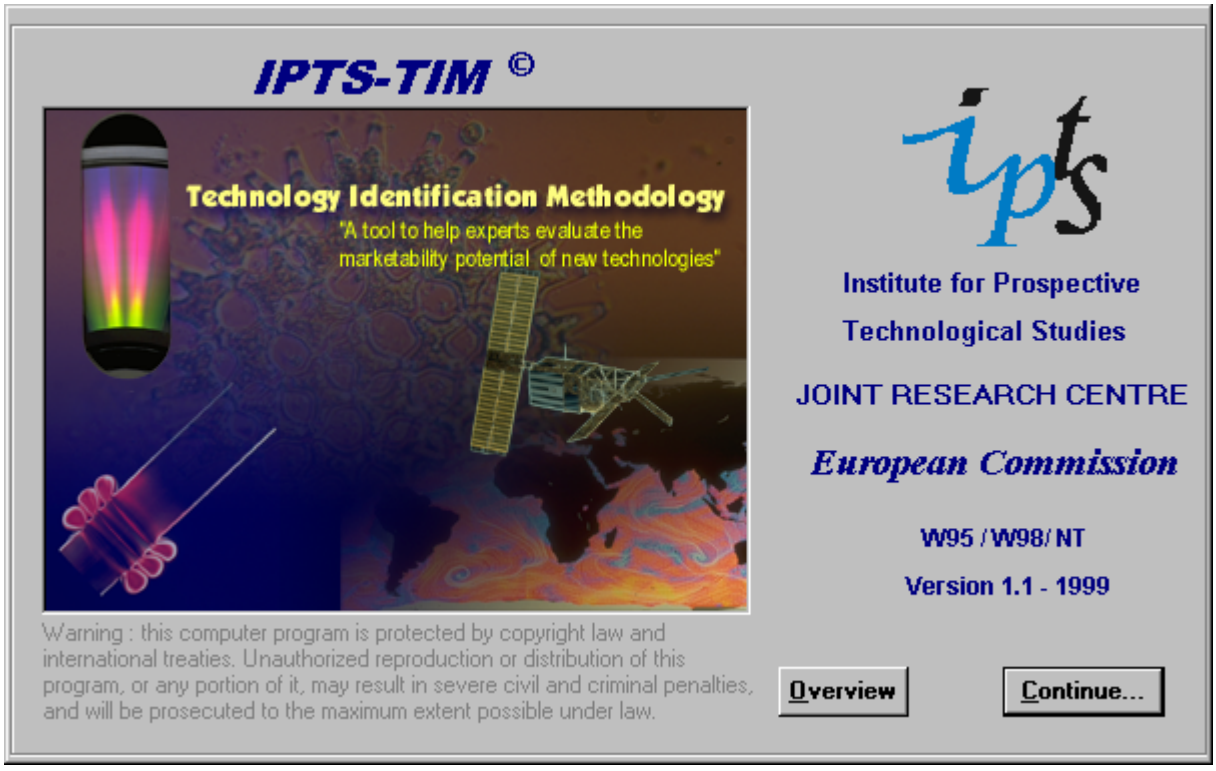
4. Software Installation

The software requires two steps to install. Firstly, by executing the file Setup.exe (included in the CD-Rom) the setup will install the required files to operate the ***IPTS-TIM*** software. After this first installation the system needs to be reinitialised. To do so, the user needs to turn off the computer. With this first step the computer has been prepared to be able to operate the software. After restarting the computer, the user needs to execute the file Setup.exe a second time. With this operation, the software installation will take place entering in the setup wizard for the installation of the ***IPTS-TIM*** . If the installation has taken place correctly, a message will appear informing the user that "the software has been installed satisfactorily".

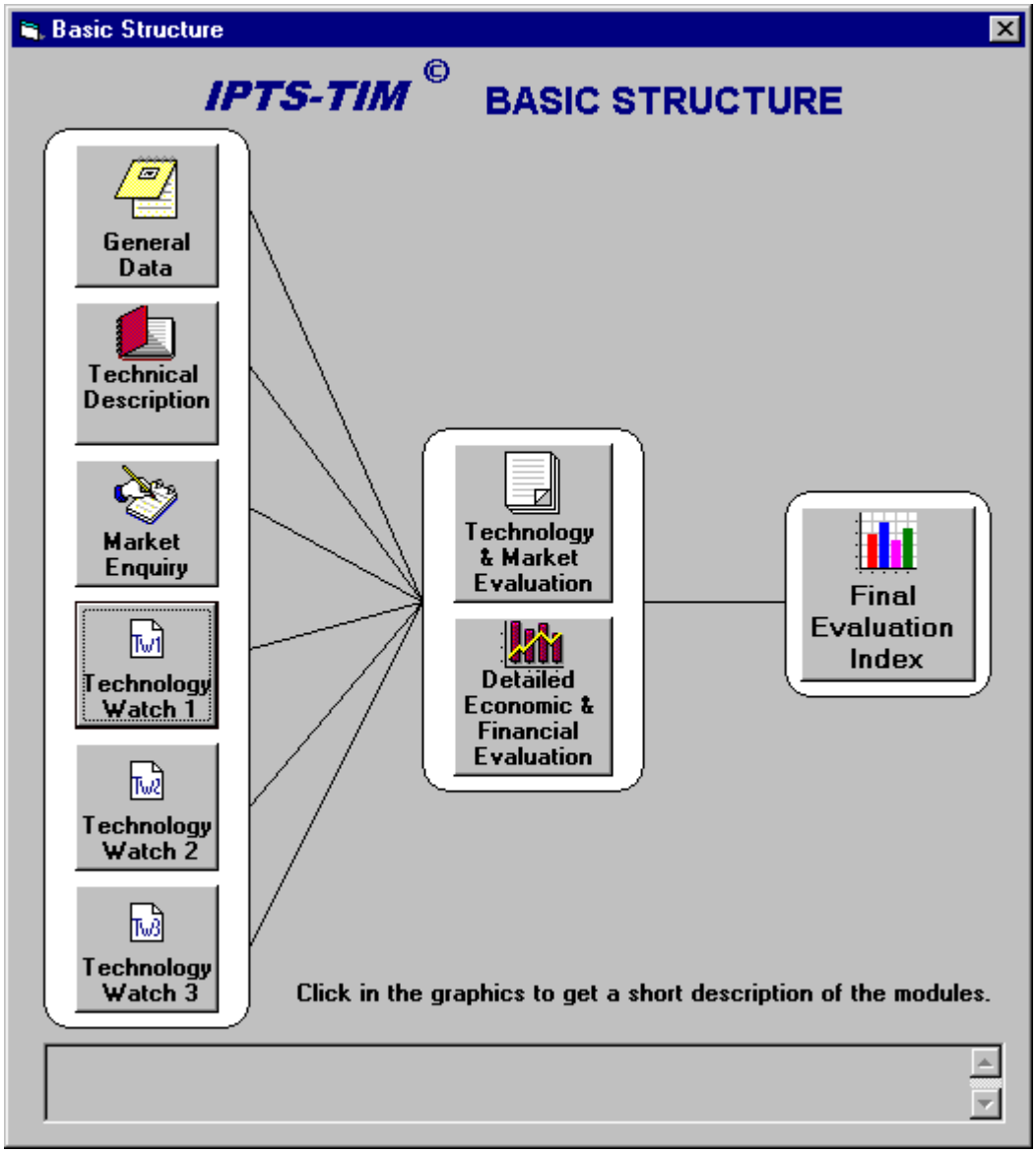
In the case of experiencing problems during the installation process, the ***IPTS-TIM*** support team can be contacted at the following e-mail address: IPTS-TIM@jrc.es

5. Starting the software

Once the software is installed, click on C:/Program files/IPTS-TIM Software/IPTS-TIM_1.exe. The software then starts with a welcome window.



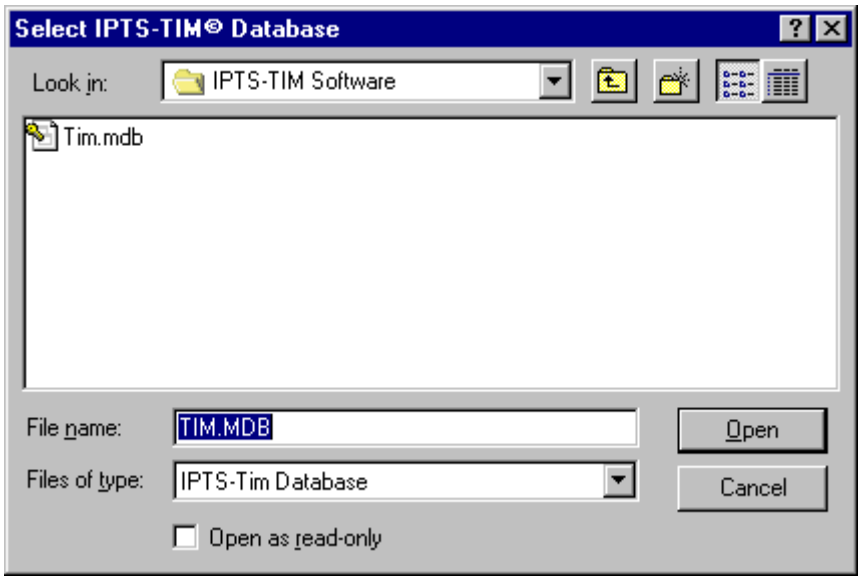
To get more information about this program, click on "**Overview**" and the following screen will then appear:



This screen shows the software's basic structure.

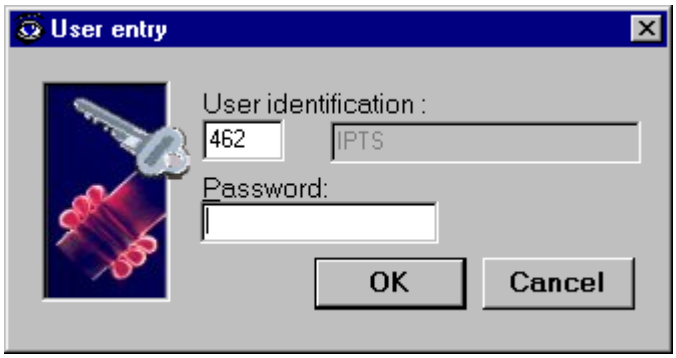
To continue, close this window and then, click on the "Continue" button.

Note: The first time that you are installing/using the software, a message will appear asking you to select the database.



By default, the software is installed in the directory:
« C:\PROGRAMS FILES\ IPTS-TIM Software\ ».

In most cases, the database is located in the same directory. It is sufficient to simply select the file and click on "open". Otherwise, go into the directory where the database is located.
If you do not have access to a name and password, you will not be able to go any further.



By default, after the installation, the identification number is 462 and the password is « IPTS ». This information can be changed into the Software.

At this stage, keyboard your user number and your password to connect.

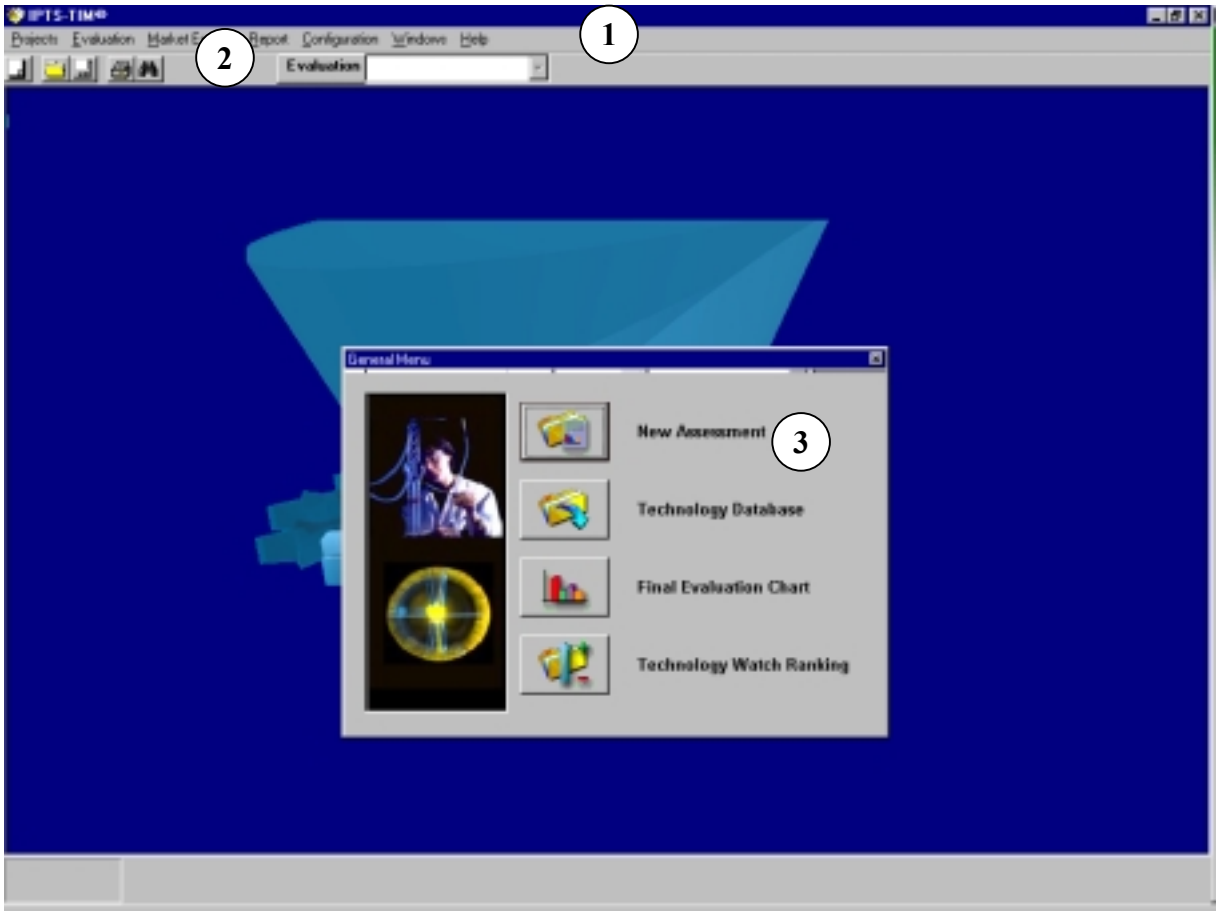
If you enter an invalid name or password, your connection will be refused, and you will be informed by a message.

If everything has gone well, you are now connected and you can enter the ***IPTS-TIM*** database.

6. Use of *IPTS-TIM*

6.1. Interface with the user

The ***IPTS-TIM*** main menu is presented in the following way:

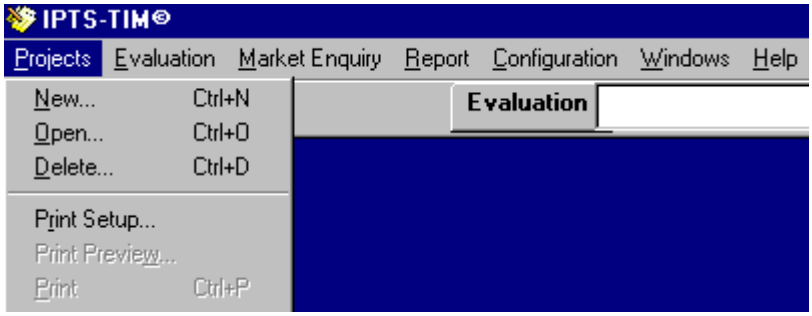


1. The top left-hand part represents the main application menus.
2. The part below the application menu represents the toolbars, which you have access to.
3. The central part contains the main applications' functions.

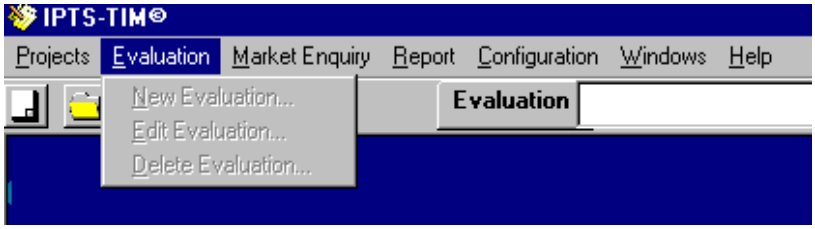
6.2. Use of menus

The application consists of 7 menu items:

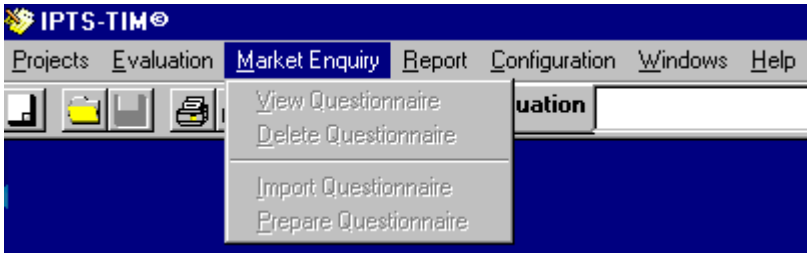
- **Projects**: Access to projects (creation, deletion…).



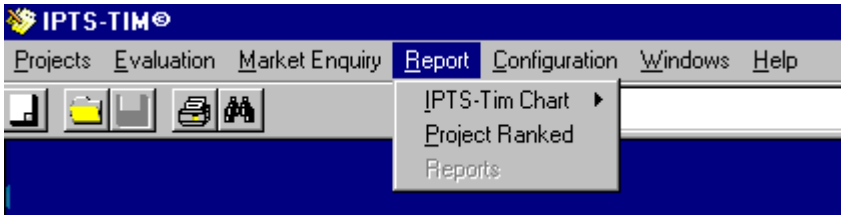
- **Evaluation**: Access to evaluations



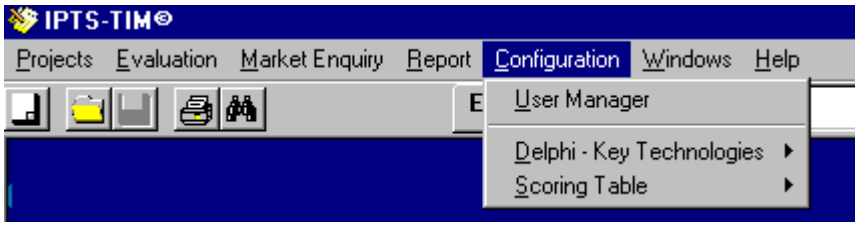
- **Market Enquiry**: Access to Market Enquiry



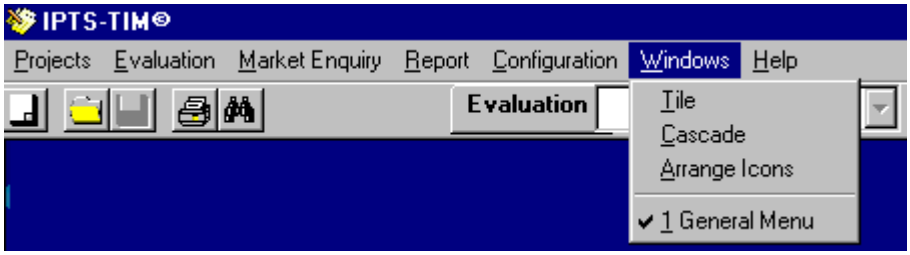
- **Report**: Access to the Report



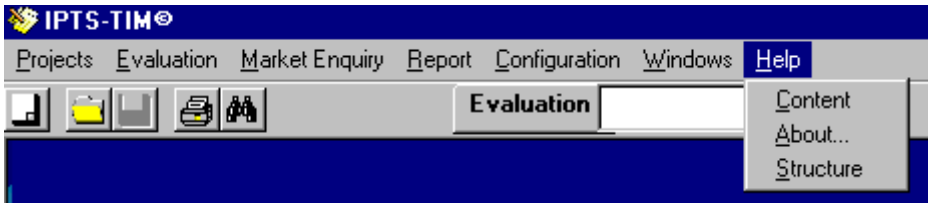
- **Configuration**: Access to the Configuration



- **Windows**: Access to the windows application



- **Help**: Access to Help function



Some menus contain sub-menus.

6.3. Tool bar

The tool bar is a shortcut to the menu for certain functions. Depending on the screen you are on, it is possible to access certain functions directly through the tool bar.


Create a new project (equivalent to « Projects », »New »)


Open a project (equivalent to « Projects », « Open »)


Save modifications (only in display mode of a project, equivalent to « Project », « Save »)

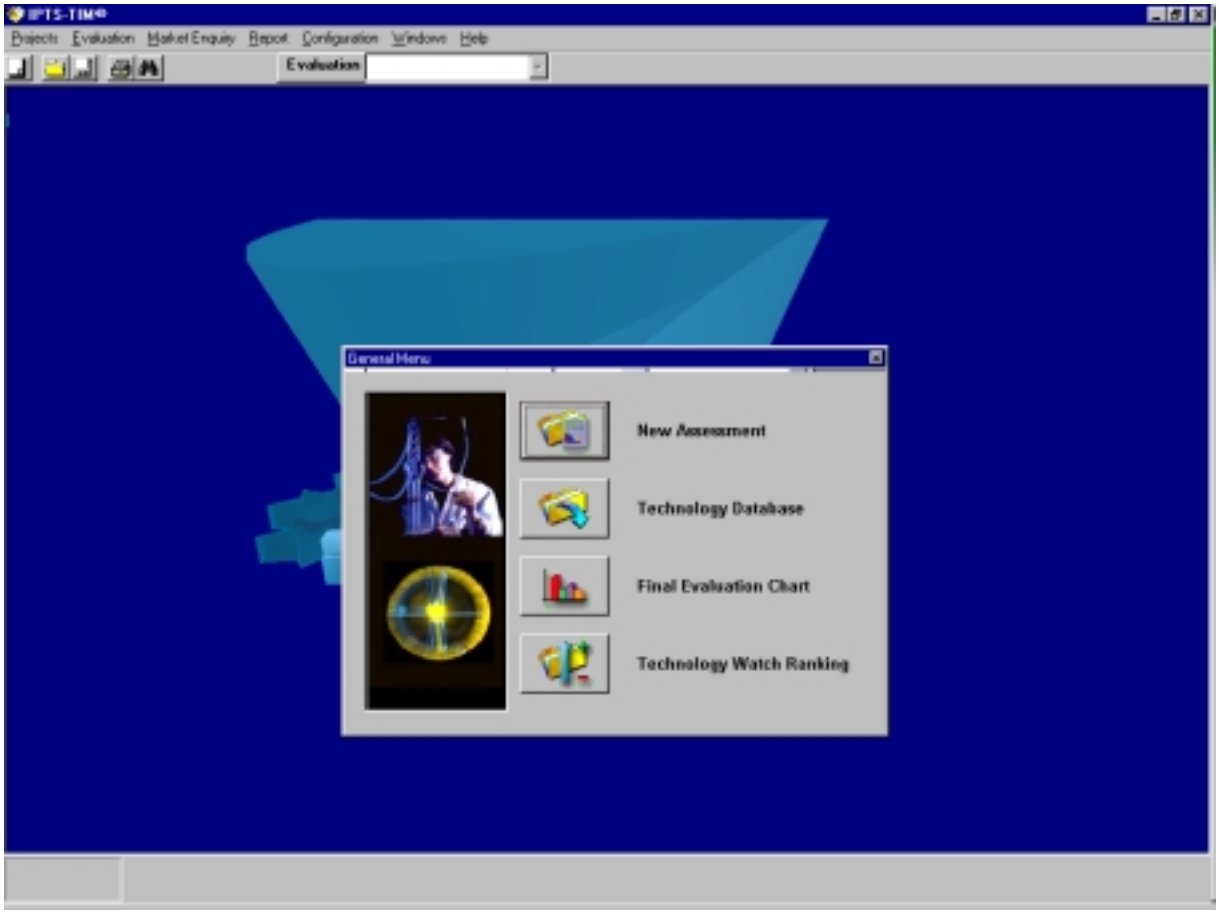

Print the current window (equivalent to « Project », « Print »)


Search for a project for a technology previously evaluated

7. Creating a new project

To create a new technology or project assessment, click on «New Project » in the window in the middle of the screen or click on « Projects», «New».

The following screen will then appear:



The Menu on the left part of the screen shows you the options to be followed to evaluate the technology / project.

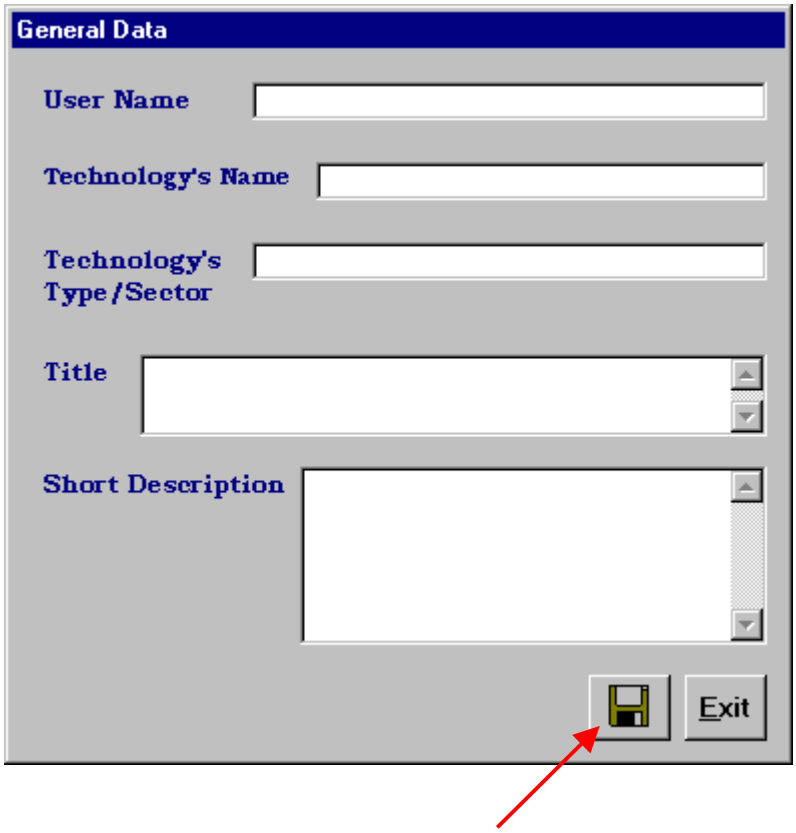
<u>You can follow the example provided before you start your evaluation</u>:

You may want to first follow an example to become more familiar with the software before starting your technology/project'' evaluation: Click on the «Technology Database» button and then select the technology/project listed with the Nº 1.

7.1. General Data

The general data concerns information about who is going to evaluate and a short/basic information about the technology or project being evaluated.

If you select this option, the following window will appear:



Once you have finished this task, click on the "save" button.

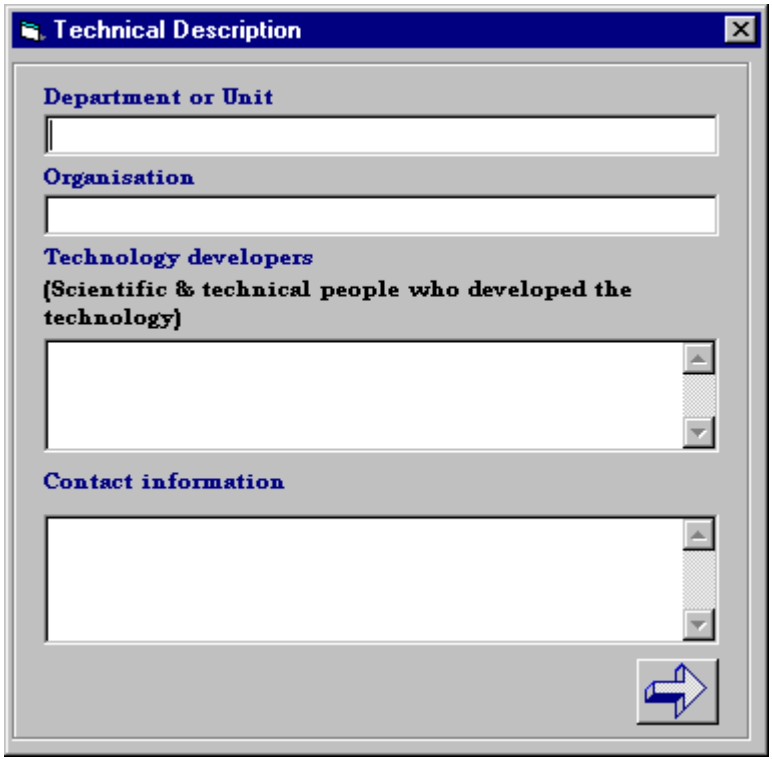
The evaluation can continue only if this information is filled in.

7.2. Technical Description

The input required in the technical description refers to technical information concerning the technology or the state-of-the art of the project, including information related to the situation with regards to: intellectual property rights, applications, innovation aspects, etc.

This information is not compulsory, but the degree of completeness achieved will have a direct influence on the accuracy of the overall results obtained in the technology or project evaluation.

If you select the technical description option, the following window will appear:

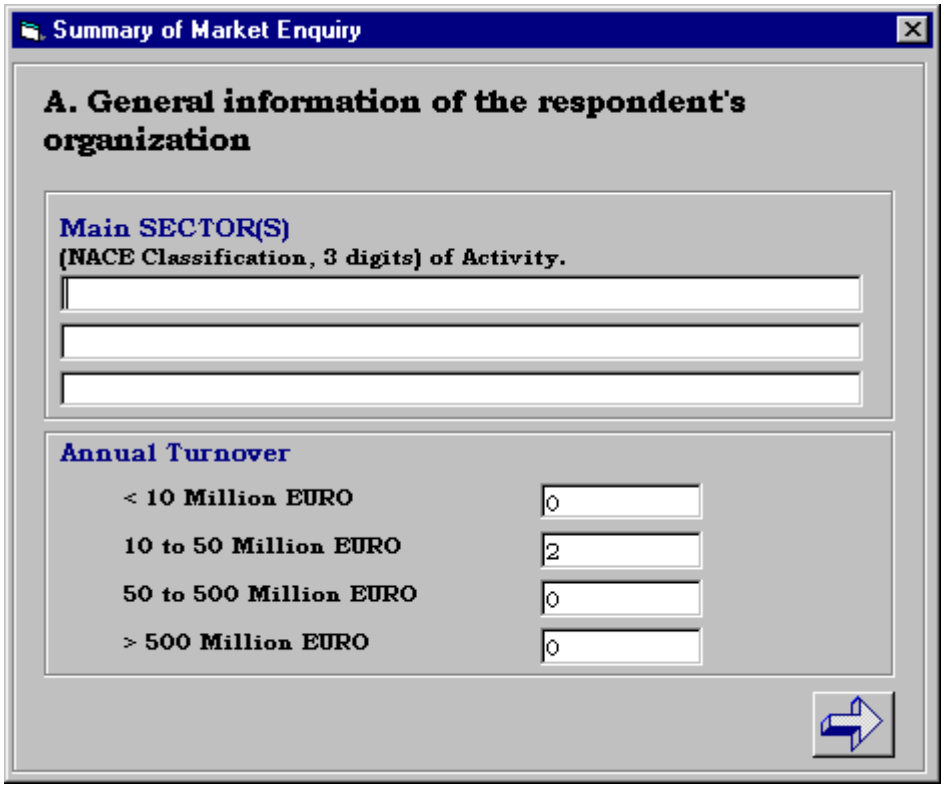


The Technology Description screen contains 6 steps.

7.3. Market Enquiry

This module allows to identify the potential market attractiveness of a particular technology/project, including relevant economic information, alternative applications, potential market segments for technology application, etc.

If you select this option from the ***IPTS-TIM***© menu, the following window will appear:



The software provides a summary of the results from all Market Enquiry questionnaires received by the organisation/department regarding a particular technology. The full questionnaire is available in the software so that it may be sent and received electronically. The summary of results from the market enquiry are automatically consolidated and presented to the user in 12 steps. These results are provided in a read-only type form and cannot be modified by the user. (See annex 2 the full questionnaire form)

7.4. Technology Watch 1 - EU RTD Policies, Strategies and Programmes

7.4.1 Introduction to TW 1

The information relating to Technology Watch 1 is rather simple to use and takes little time. The information provided is about, in summarised form, the main lines of action supported under the Fifth European Commission's Research and Technological Development Framework Programme 1999-2002. The objective of this task is twofold. Firstly, to identify and construct a synthetic overview of the EU major policy lines relevant to the set of pre-selected technologies, and secondly, to provide a methodology useful for the assessment of a set of technologies.

This approach provides a quantitative methodology to perform a ranking on a set of technologies in accordance to the perceived embedding/adaptation of those

technologies to the EU policies' major lines of action. Therefore, the user evaluates, in quantitative terms, the closeness of a particular technology to the perceived current policy agenda. So, the role of this task is complementary to that of the foresight and technological assessment technology watch components. (See later)

The user matches the technology with the main actions of the RTD Framework programme linked to the technology being evaluated. The system then records the 'hits' of each of the preselected technologies according to their matching with the different EC RTD Framework Programme action lines. The user further assigns to each matching EU RTD line found a score in the range -from 1 (poor linkage) to 5 (strong linkage)- to indicate the degree of adaptation of the EU programme/policy to the corresponding technology being evaluated. The TW1 indicator is computed as an average

$$TW1 = \frac{1}{n} \sum_{i=1}^{n} s_i$$

where *i* denotes action line, *n* is the total number of hits for the technology and *s* is the assigned score to the matching of each of the hits to the technology.

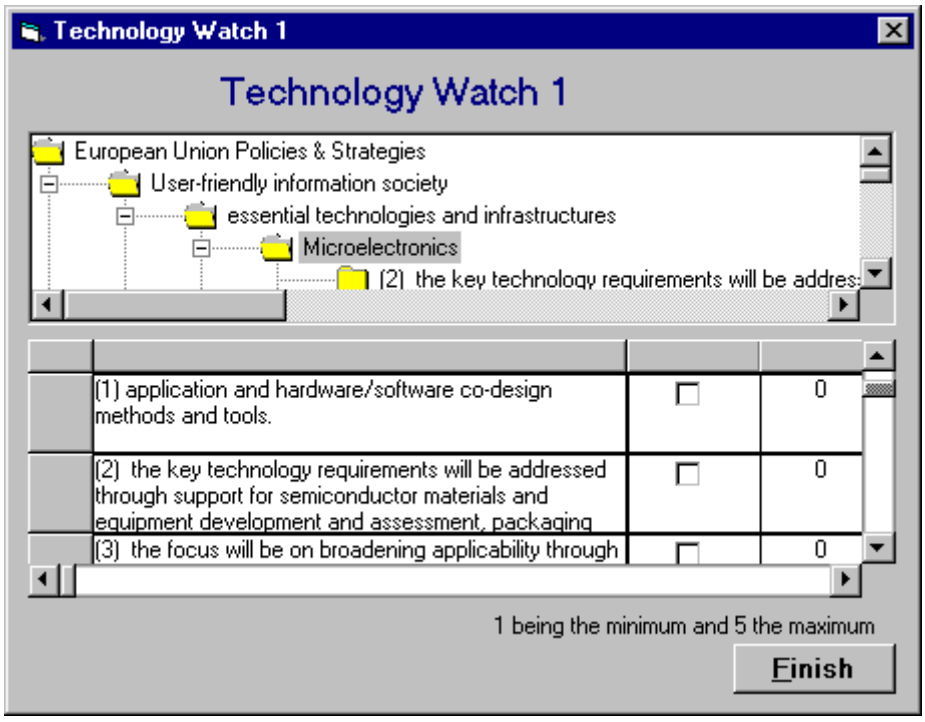
7.4.2 User's guide

A list of scientific and technological domains, structured in the tree-form is provided in the upper part of the screen. The user should click on the appropriate information and provide, on the inferior part of the screen, the level of importance for the technology/project under evaluation.

This level of importance will be used later to calculate the TW1 index.

If a scientific and technological domain does not fit to technology/project under evaluation, it is not necessary to enter 0 for importance. Simply skip it.

If you select this option in the menu, the following window will appear:



7.5 Technology Watch 2 – Prospective Study Analysis

7.5.1 Introduction to TW2

This component provides a digested overview of the results deriving from different foresight and critical technology studies carried out worldwide. This TW component transforms information of a qualitative type into quantitative information. The "technological orientation" character of the present methodology limits the scope to two types of studies: Delphi studies and Key/ Critical technologies studies

The Key/ Critical technologies study consists in a list of technologies that are rated as critical according to a selected set of criteria.

Furthermore, a national critical technologies list doesn't include usually more than 100 technology families; thus it is targeted to provide a quick assessment of the technology being evaluated, despite the fact that it does not cover all aspects in detail of a given technological area.

The expert provides a score on the range from 1 (lowest value) to 5 (highest value) considering the following criteria regarding the status, innovation, competition and market size based on the information provided by the system.

The user matches the connection of the technology being evaluated with the topics contained in the prospective technological studies. The weights applied depend on:

A. topic directly related with the technology 1

B. topic referring to enabling technologies 0.75

C. topic contributing to define a picture of the general frame for the development of the technology 0.50

D. topic referring to competing technologies 0.25

Technology Watch 2 module contains information originating from French Key Technologies study (under permission). This information provides - in addition to France's position - the relative position of Europe as related to the technology taken into account. The software has been designed to be able to endorse additional world-wide prospective studies' results.

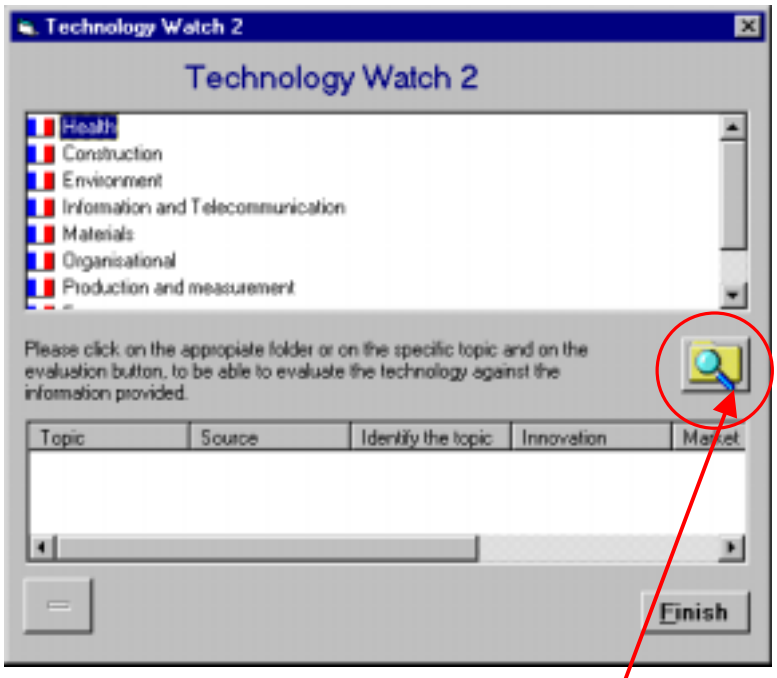
The computation of the TW2 indicator uses the following formula:

$$TW2 = \frac{1}{n} \sum_{i=1}^{n} \left[(0.3S_i + 0.3I_i + 0.2C_i + 0.2M_i).w_i \right]$$

where i refers to the topic found in the prospective study (n is the total number of topic found related to a particular technology) and w_i is the weight given to the matching of the topic with the technology being evaluated depending on their degree of correlation.

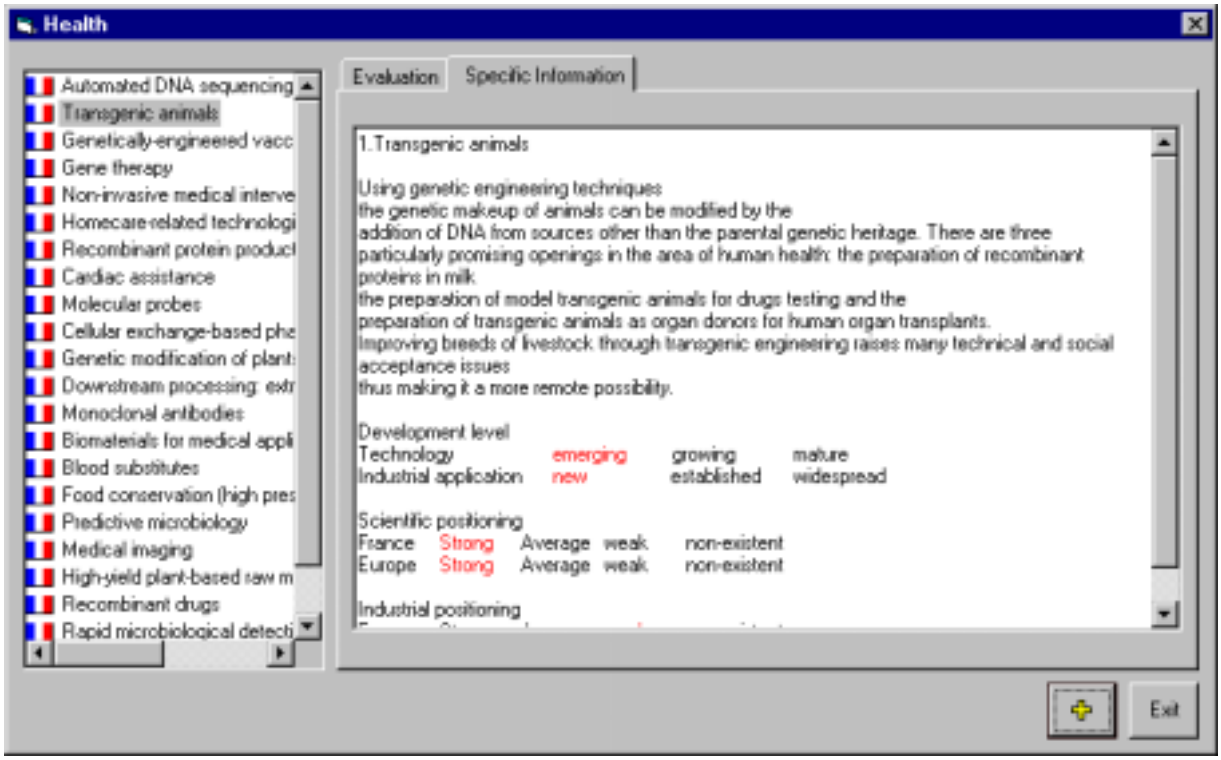
7.5.2 User's guide

If you select this option, the following window will then appear:

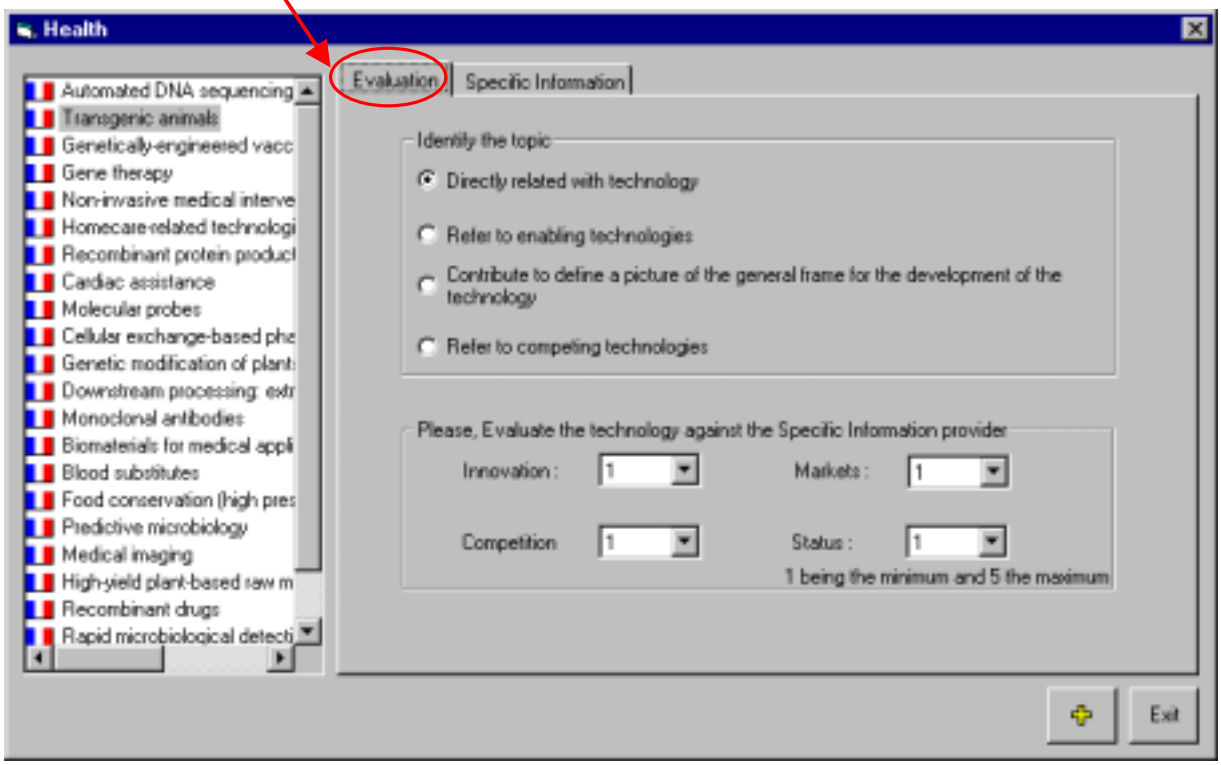


Please select the appropriate sector/area found in the top window (in the figure "Health" was selected), which corresponds to the technology/project under evaluation, and then click on the more specific topic of the list that will appear to evaluate your technology; then click on the evaluation button.

There is no technology rating in the French Key Technologies study. Instead, comments and recommendations are provided for single technologies or for technology groups.



Once the information is displayed (in the example, under "Transgenic animals"), you must read it and then provide evaluation values. To implement this task, click on the « Evaluation » tab



For each technology considered in the French Key Technology Study (Tech.FKTS), the user should define the possible impact of the technology being evaluated (TechUnderEval), by providing the following information:

- TechUnderEval direct relation with the Tech.FKTS
- Current/future use and market the TechUnderEval
- It could contribute to innovate as referring to the Tech. FKTS information or help in reaching future development targets.
- Competing technologies to TechUnderEva

This information is important because it contributes to a better evaluation of the technological project.

There are no guidelines to value attribution: the evaluation should be carried out according to your experience and your understanding of the present situation and future developments.

Once you have filled in the appropriate information, click on the « + » button to record it. In order to get rid of this module, click on the cross button. The TechUnderEval is displayed below with the criteria and values you have keyboarded.

To delete the information you have provided in this module, please select it and then click on the « –» button. To modify the information you have, you should carry out the same operation from the beginning of this sub-module.

7.6. Technology Watch 3 – Analysis of other relevant information

7.6.1 Introduction to TW3

This component complements the user's available scientific and technological information with information retrieved from specialised information databases covering relevant domains for the commercialisation of the technology, such as intellectual property rights, industrial, market and economic databases.
This component searches for information on exploitability and market attractiveness for a portfolio of technologies. In comparison to those, this methodology aims to examine the current status of the pre-selected technologies on a stand-alone basis using a number of complementary information sources.

The framework methodology uses the following information sources:

- Database search
- Bibliographic examination
- Internet search
- Patents

Database Search: On-line information providers make access available to a large number of databases, which cover many subjects and themes. The databases themselves are grouped into subject areas to ease searching. This was further

supported by two search modes, which allowed a structured approach. Most of these databases allow to perform searches based on keywords, sentences and boolean operator providing the number of "hits" from the search.

Internet Search: The TW-Assessment component directs the user to pre-identified internet sites of recognised "quality". These cover well-known scientific journals and international organisations, which specialise in publishing scientific and technological information.

Patents Search: Access to on-line database information providers allows to search patent sources. Patent information can be a key indicator to assess the interest for the technology under examination. In the case where patents are already in place it is possible to gain supplementary information regarding its present status and validity.

The TW3 indicator is constructed using a weighted average of the i references retrieved when conducting a search for a particular technology. The technology potential is evaluated considering four aspects: competitiveness C_i, status S_i, market M_i and innovation I_i) applying different factor loadings according to the following formula

$$TW3 = \frac{1}{n}\left[0.2\sum_{i=1}^{n} C_i + 0.3\sum_{i=1}^{n} S_i + 0.2\sum_{i=1}^{n} M_i + 0.3\sum_{i=1}^{n} I_i\right]$$

7.6.2 User's guide

If you select this option, the following window will appear:

Firstly, you should keyboard the source that may have the name concerning this nformation. The link may contain a description or URL if the information comes from the WEB. Finally, « Number of reference » serves to indicate the name of the data found for this source.

Once you have this information, in is convenient to give a level of importance for innovation, Competitiveness, Market and Status in order to be able to calculate the index.

Repeat these operations as many time as necessary.

8. Technology Ranking from TW results

8.1 Introduction

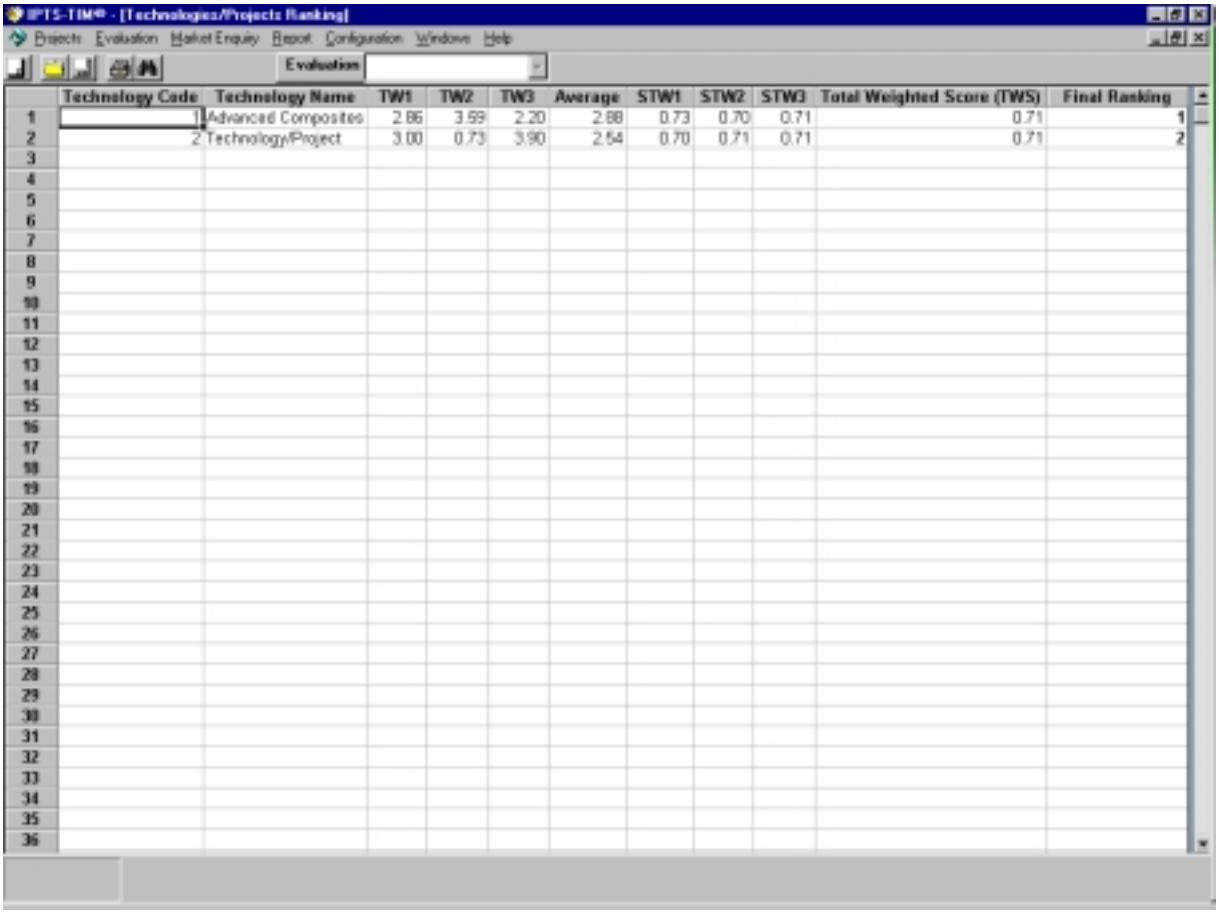
This module allows to compare projects/technologies with information from the three TW sub-modules. The technologies/projects are ranked in function of a Standardised Index. The Technology Watch ranking is elaborated from the combination of the results of the different TW indicators. Since the TW indicators were developed independently, in order to make them comparable, the scores of the three independent TW indicators are standardised according to a normal distribution $x_i \sim N(0,\sigma)$. After the scores are standardised (i.e. STW1, STW2, STW3), a joint index or Total Weighted Score (TWS) is computed according to the following formula:

$$TWS = \sum_{i=1}^{3} p_i \; z_i$$

where p_i is the weighing factor and z_i is the standardised score for each of the factors. The p_i applied by default to each factor is 1/3. The results for the TWS allow to rank a portfolio of technologies.

8.2 User's guide

To get this ranking information, click on « Report » and «Technology/Project Ranking». The screen shown below will appear:



	Technology Code	Technology Name	TW1	TW2	TW3	Average	STW1	STW2	STW3	Total Weighted Score (TWS)	Final Ranking
1	1	Advanced Composites	2.86	3.59	2.20	2.88	0.73	0.70	0.71	0.71	1
2	2	Technology/Project	3.00	0.73	3.90	2.54	0.70	0.71	0.71	0.71	2
3											
4											
5											
6											
7											
8											
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36											

This window includes the following information for each technology or project:

Technology Code: Identifying Project/Technology
Technology Name: Technology/Project title

TW1: Technology Watch 1 Index
TW2: Technology Watch 2 Index
TW3: Technology Watch 3 Index
Average: Average of Technology Watch 1, 2 and 3 indexes

STW1: TW1 Standardised index
STW2: TW2 Standardised index
STW3: TW3 Standardised index
TWS: Total Weighted (Standardised) Score index (it may be positive or negative)

Final Ranking: Technology ranking from 1 (highest value/position) to ∞.

9. Technology and market evaluation module (T&MEM)

9.1 Introduction

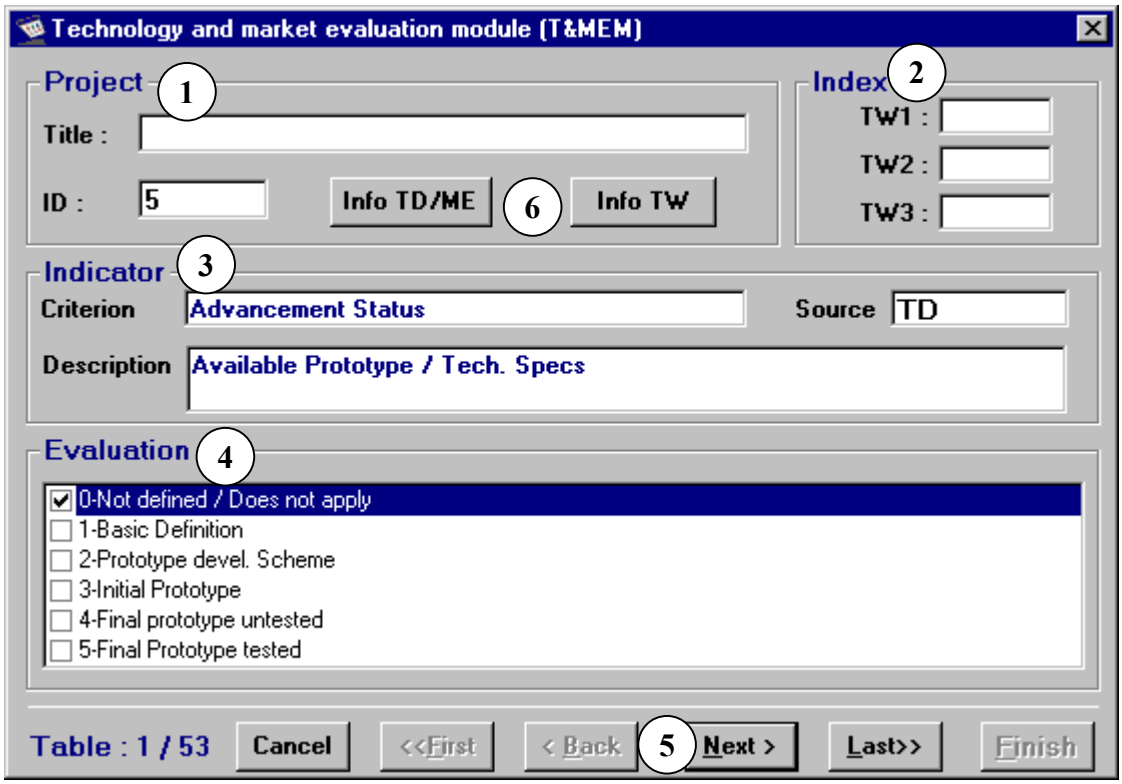
The technology and market evaluation module (T&MEM) permits to evaluate, in detail and in a structured and traceable way, the technology or the project.

This module is composed of 53 evaluation steps that correspond to 20 indicators, which belong under the four main criteria (Development level, Innovative potential,

Market potential, Strategic Importance). In each evaluation step you should define the level of relevance for the technology under examination, and this allows you to give the project a total score. The total score has a top value of 100 (i.e.: the technologies or projects closer to 100 are better than that closer to 0).

9.2 User's guide

The following dialogue box will appear at the beginning:



1. Reminder of the technology or project you are evaluating
2. Provides TW1, TW2 and TW3 indexes as possible reference information
3. Indication of the technology related to the evaluation criterion and the description of its specificity.
4. Allows you to define the level of relevance for the technology under examination
5. Navigation interface (same menu as for a new technology/project evaluation)
6. The "Info TD/ME" and "Info TW" buttons allow you, at any moment, to display the information you have already selected and worked out (i.e. in Technical Description, Market Enquiry and TW modules), which is relevant for the evaluation criteria and the related specific questions you are dealing with to evaluate.

As already mentioned, in each evaluation step you should define the level of relevance for the technology under examination (0 for the weakest, 5 for the strongest).

To move from one question to another, click on « Back » or « Next ».

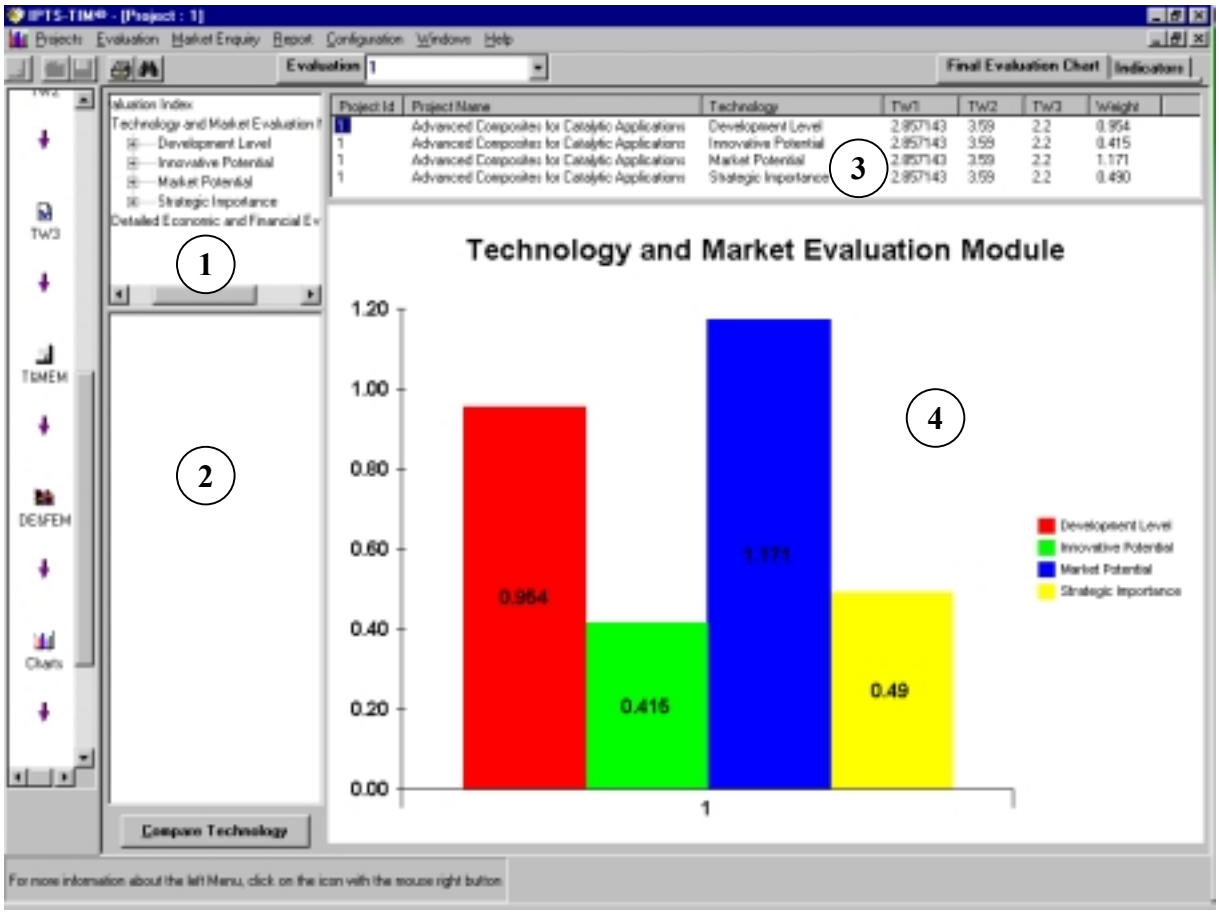
At any time you can stop evaluating through the T&MEM evaluation steps by clicking on « Cancel ».

Once all the 53 questionnaires have been properly worked out, please click on « Finish ».

10. T&MEM's Synthetic Result

This screen allows you to display the Technology and Market Evaluation results in a tree type of diagram and in function to the main four evaluation criteria (i.e.: Development Level, Innovative Level; Market Potential; Strategic Importance).

To access this function click on "Charts" button in the left menu.

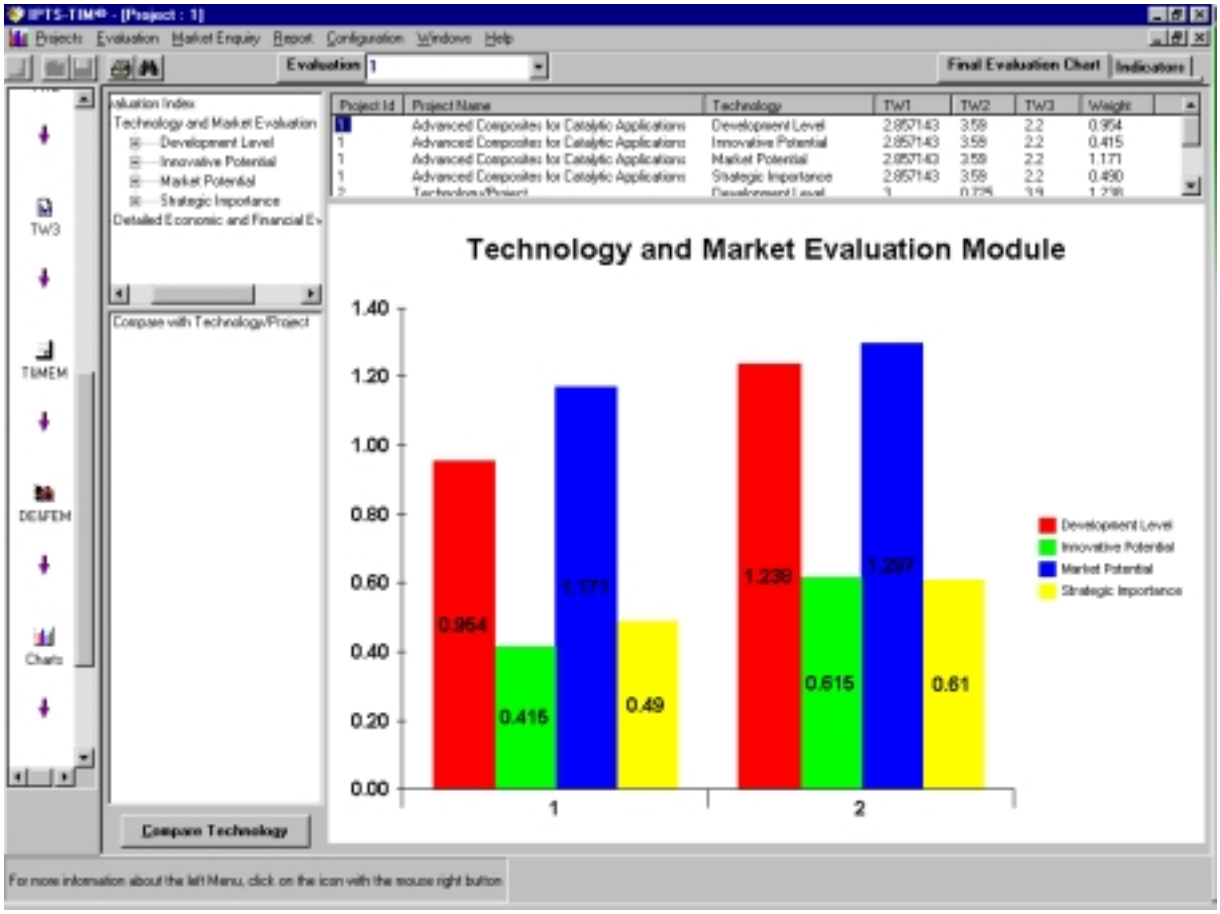


1. Structure of the T&MEM's index
2. Technologies/Projects for comparison
3. Numerical values
4. Graphical representation of the data

This graph representation is useful to examine the elements of the scoring table. In this example, by clicking on « Technology level », you can display the importance of « Technology » and « Industrial Applications » in graphical and numerical form showing the relative values of the four main evaluation criteria.

This screen also allows you to compare technologies/projects. To do this, click on « Compare Technology ». A dialogue box will be opened; then select the technology/project you wish to compare and click on « OK ».

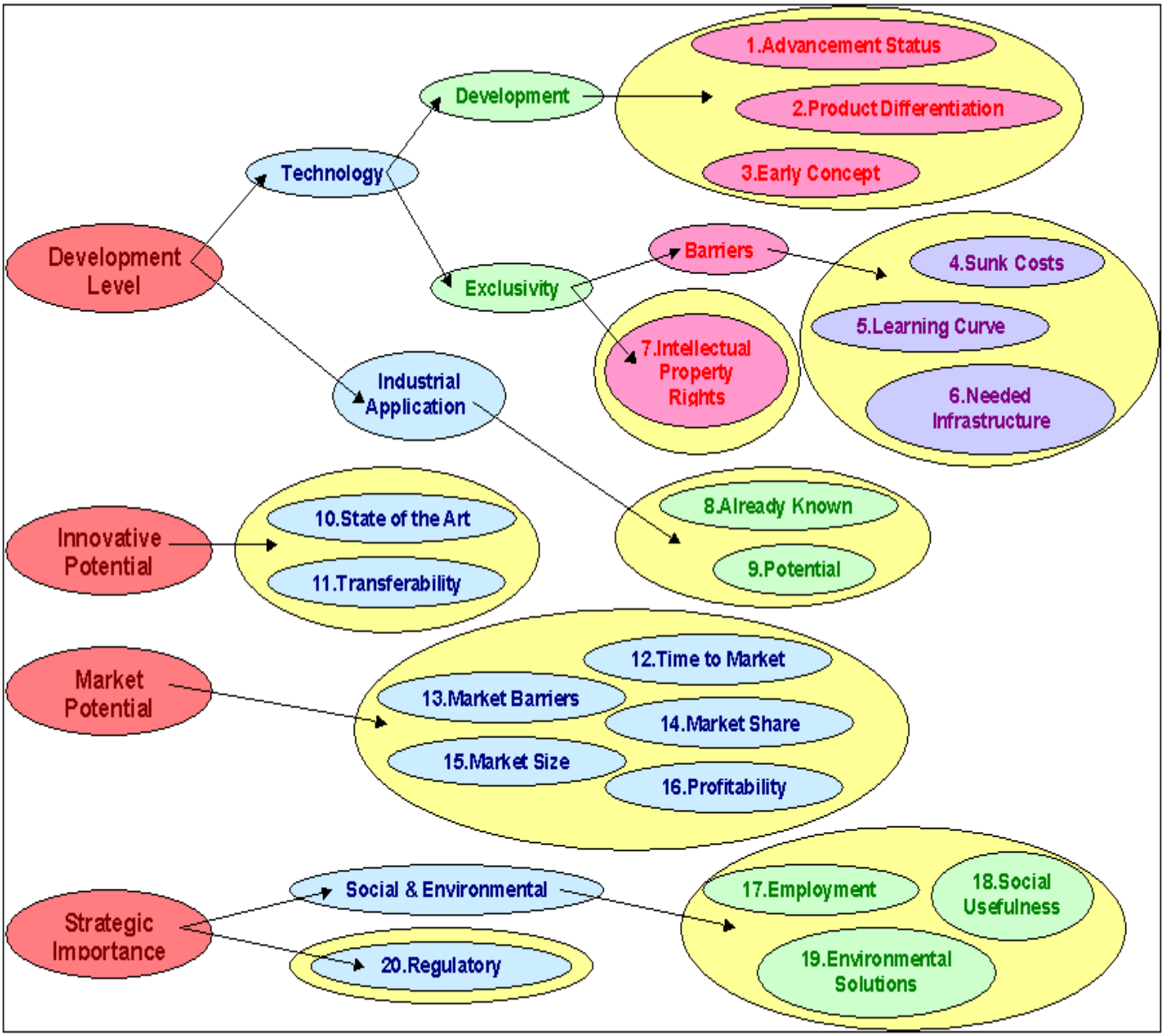
You can now compare 2 (or more) projects/technologies:



11. T&MEM's synthetic result by specific indicators

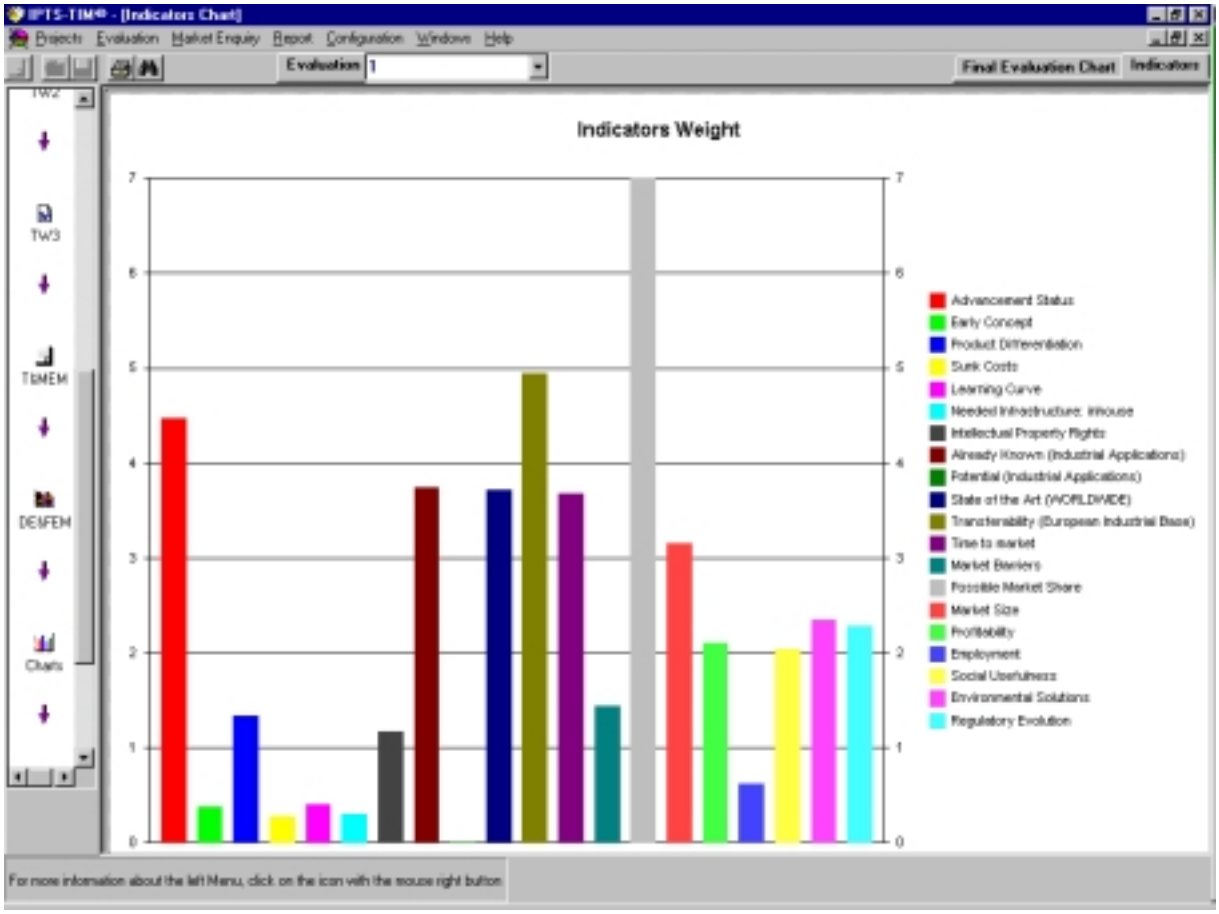
This function allows you to display the relative importance of each of the 20 indicators on the T&MEM synthetic result. These indicators are usually grouped in four main evaluation criteria: Development; Innovation; Market Strategy (e.g., see previous section). It allows you to better appreciate the Technology's strong and weak points according to the T&MEM evaluation.

The structure of the T&MEM's indicators is the following:



To display the indicators graph, click on the "Charts" button in the left menu and the "Indicators" option on the toolbar.

The following screen will appear:



The graph represents the importance of each indicator on the T&MEM for the technology/project. The sum of the 20 indicators' values represents 100% of the synthetic value result of the Technology/project.

The value of each indicator shown in the graph is in percentage form.

12. Detailed Economic and Financial Evaluation module (DE&FEM)

12.1. Introduction

This module (in effect it can be considered an input-output module) establishes possible scenarios for the commercialisation and transfer of the technology. Since this module is based on quantitative information, the module evaluates expected returns of technology transfer processes. Basically, the model calculates common formulas for investment projects decisions such as net present value, return on investment, pay-back and others more common to technology transfer processes such as maintenance fees, royalty shares as well as opening the possibility to incorporate decision under uncertainty through the use of decision trees analysis.

The Detailed Economic and Financial Evaluation Module **(DE&FEM)** can be considered a stand-alone module or it can be integrated with the rest of the modules of the ***IPTS-TIM*** ©. This module is based on the Technology Valuation Spreadsheet Valuate© developed by Martha Luehrmann from the Lawrence Berkeley National Laboratory for the University of California. The module permits to perform, for a technology investment project, a detailed economic and financial evaluation on the potential profitability of the project.

Integration with other *IPTS-TIM*© Modules

Based on the results of the **DE&FEM,** the user assigns a value on a scale from 0 (no information available) to 5 (high relevance) to serve as an input for the **Final Evaluation Index (FEI).**

General operation of the Detailed Economic and Financial Evaluation Module

In the **DE&FEM** module, the cells which refer to the basic inputs that can be modified by the user are shaded in PURPLE. Unshaded cells are calculated automatically by the software program.

12.2. User guide

To access this module, click on « DE&FEM » in the left menu.

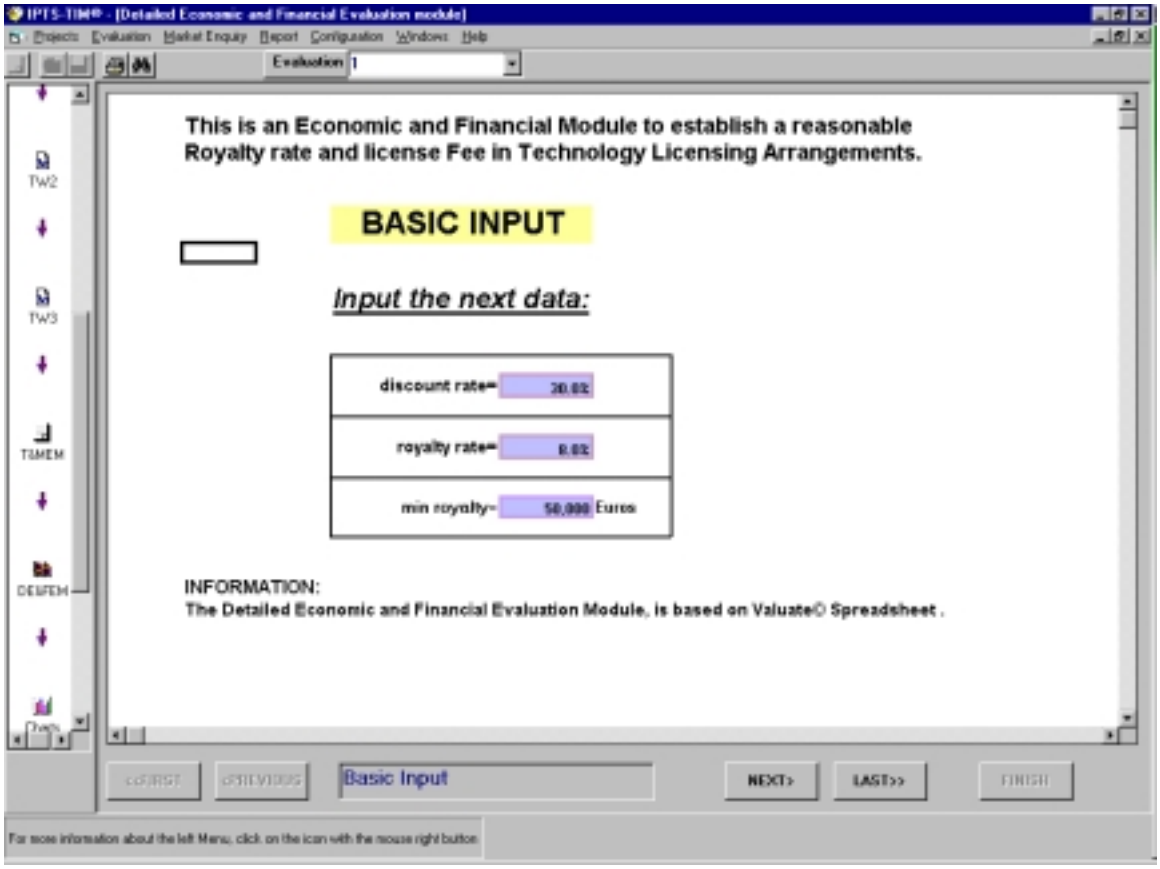
The DE&FEM is made up of 10 basic steps which are briefly described below:

Step 1: Basic Input

This screen request the user to provide the basic input required in the economic and financial evaluation of the project:

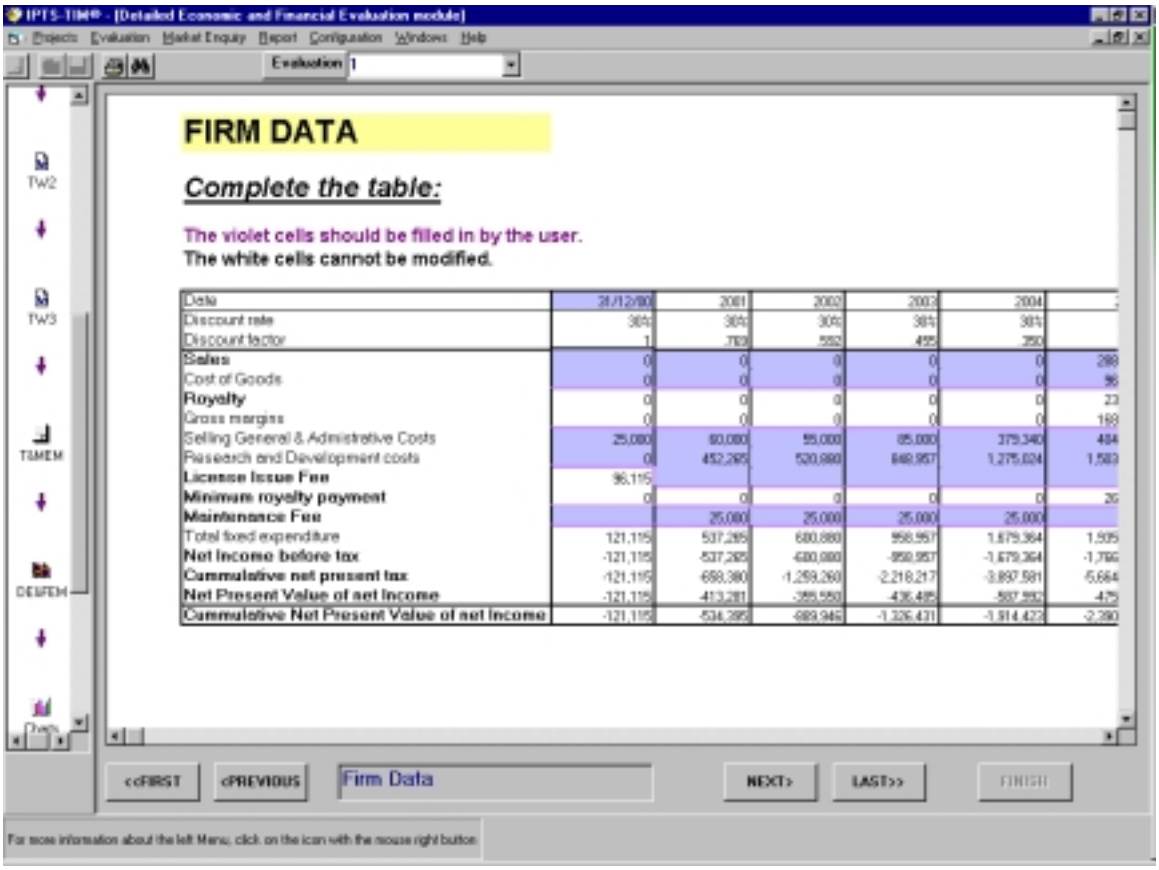
- Discount rate: Rate of discount used to convert future costs and benefits into equivalent present values; typically 20-30% for projects which involve uncertainty
- Royalty Rate Consideration paid by a Licensee to a licensor for the right to make, use and/or sell an Invention when the product is already on the market (commonly as a percentage on total sales)
- Minimum royalty Consideration paid by a Licensee to a licensor for the right to make use and/or sell an Invention when the technology is still in the development stage for commercialization.

The values of the parameters given by the user will remain constant for the whole life of the project, although the user could modify them in order to see its effect under alternative scenarios.



Step 2: Firm Data

The user should provide, on this screen, an estimate of the yearly sales of the products incorporating the technology being evaluated and of the different costs involved in the commercialisation of the product (e.g. costs of goods, selling and administrative costs, R&D costs, …) as well as the license maintenance fee.



Step 3: Licensor Data

The Licensor Data Table provides a synthetic overview of the Licensor revenues (total revenues, NPV, royalty rate)

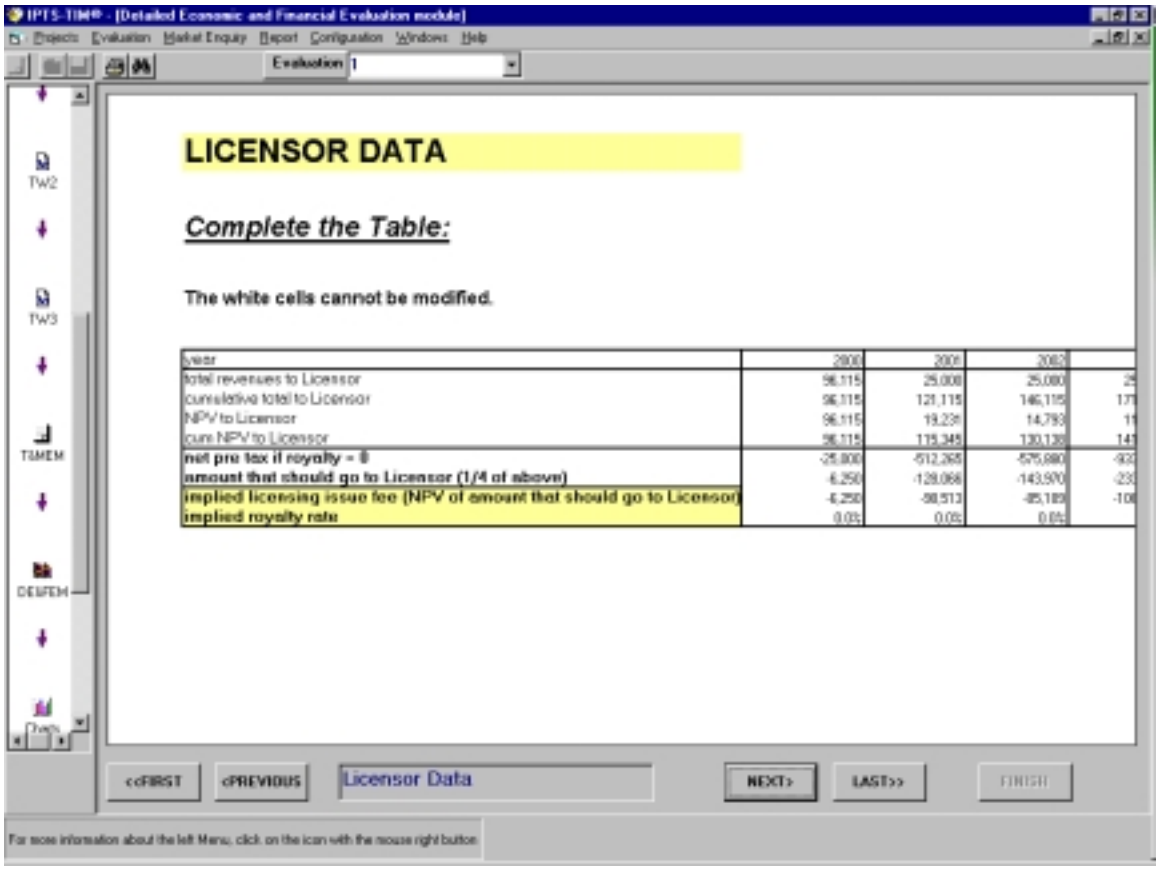
Cumulated Net Present Value

The calculation of the NPV is one of the basics of finance. The cost-benefit flows are discounted to reflect the time value of money. The cumulated net present value (CNPV) considers all future cost-benefit flows. The value of the discount rate is determined by the decision-maker. The CNPV is the current value of a stream of future payments. Let CF_t be the cash flow at time *t* and *r* is the interest rate. Suppose we have *T* future cash flows that occur at times $t_1, t_2, \ldots, t_T$.

$$CNPV = \sum_{t=1}^{T} CF_t (1+r)^t$$

If compounding is continuous, the CNPV is calculated as follows

$$CNPV = \sum_{t=1}^{T} e^{-rt} CF_t$$



Step 4: Summary of Results

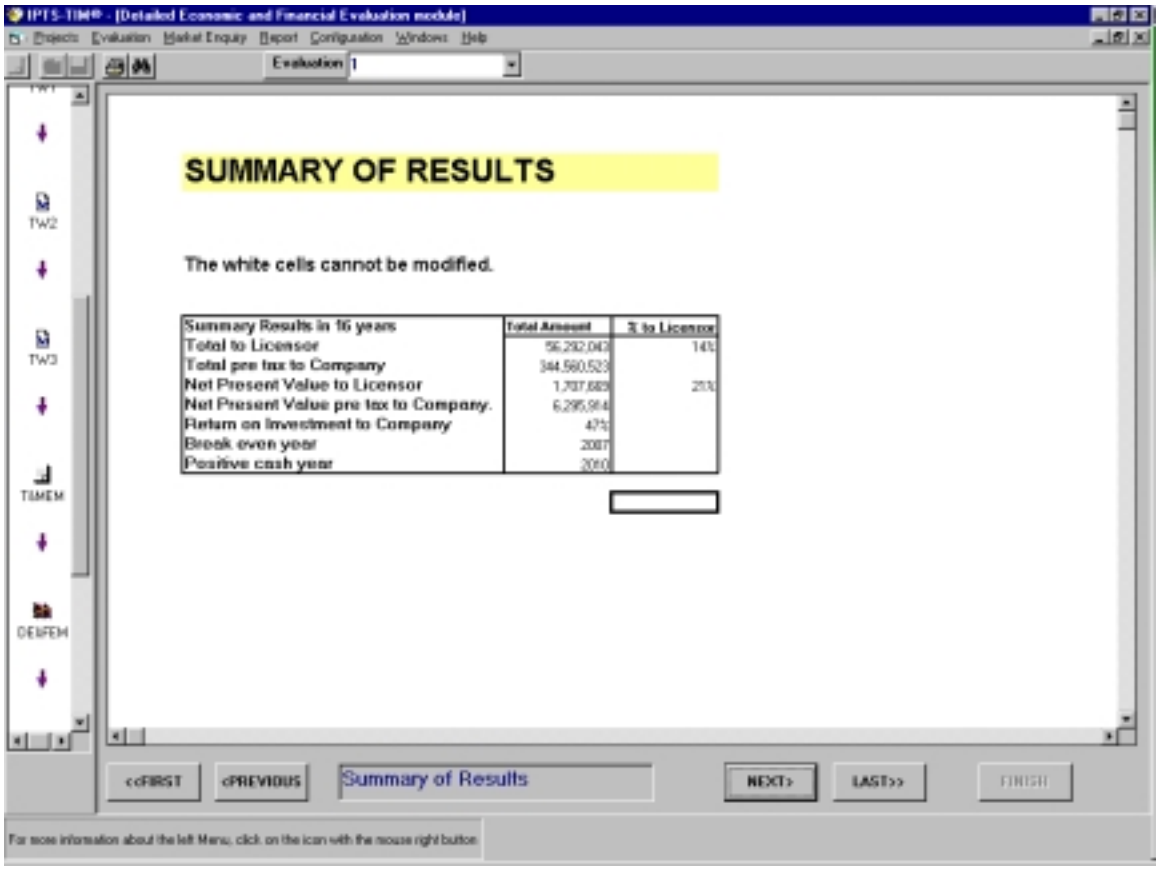
Provides a summary overview of the returns accrued to the Licensor and the Licensee during the whole life of the product, including the return on the investment to the licensee and the break even year

Internal Rate of Return

The internal rate of return (IRR) of a cash flow is the interest rate that makes the present value of a cash flow equal to zero.

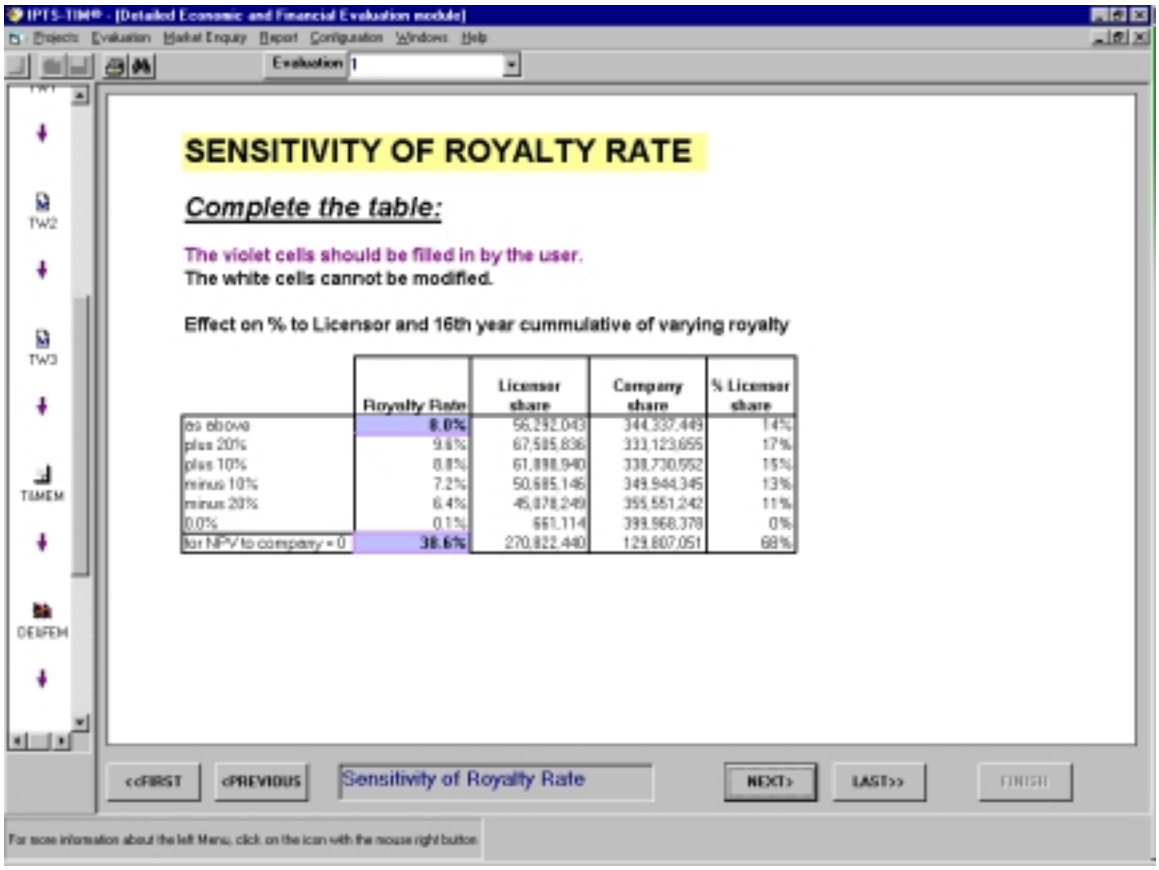
The IRR provides the rate at which future benefits should be discounted in terms of today's value. It provides decision-makers with a value expressed in percentage terms rather than in any other metric.

IRR is a method to determine the value of a project that does not depend on an arbitrary identified discount rate. The IRR method requires the calculation of a discount rate such that the discounted value of future cost-benefit flows equal the initial investment. In other words, the IRR is the rate that makes zero the NPV, the present value of cost flows minus the present value of benefits. IRR is based on the assumption that the cost-benefit flows are reinvested at the internal rate of return.



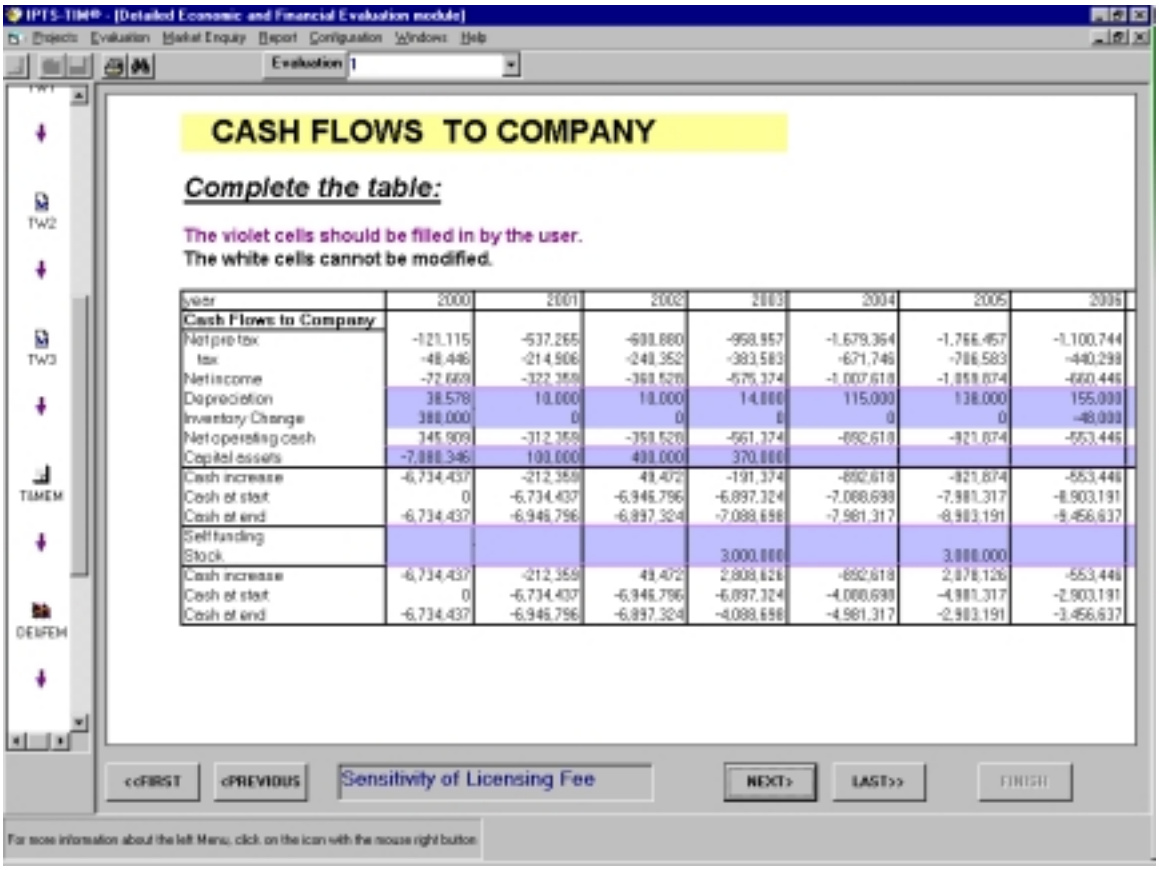
Step 5: Sensitivity of Royalty Rate

The Sensitivity Analysis of the Royalty Rate permits to examine the changes in results of the analysis when the implied royalty rate is varied over a specified range.



Step 6: Cash Flows to Company

Concerning the licensee, this Table provides detailed information on the cash flows generated. The user can modify some of the cells.



Step 7: Decision Tree Analysis

Introduction Decision Tree Analysis

A decision tree describes the decision options available to the decision-maker at each relevant point in time (decision points) and the uncertain events that can occur at each relevant point in time (chance points). A decision tree is a tool that facilitates the process of decision making under uncertainty and with many interrelated alternatives. Decision tree analysis assumes that the criterion used by the decision-maker is the expected value.

Basically, a decision tree consists of a graphical representation of a decision problem. In the tree, all the branches represent both acts and events. A square node in a decision tree represents a point where a mutually exclusive decision has to be made. A round node represents a point where one of the uncertain mutually exclusive states of nature can occur. At the end of the branches the payoffs are shown for each of the alternatives (terminal value).

The elements needed to build a decision tree are the cash flows that result from the decisions and chance events and the probabilities assigned to each of the chance events. A probability is assigned to each branch originating at a chance node and the probabilities at each chance node must add up to one. The assignation of probabilities to possible events is normally based on experience, knowledge and prediction. These probabilities are, most of the time, of a subjective character and depend on the decision-maker.

Each decision and chance have cash flows assigned with it (positive, negative or zero). Adding up the cash flows along each path, or **scenario,** generates the **terminal value** to each terminal node of the tree.

Decision tree analysis is resolved by working backwards from the final decision or chance nodes, to previous decision or chance nodes, calculating the **payoff value** associated with each node of the decision tree.

The **payoff value** at each chance node is the **expected value** of the payoffs of each of the subsequent nodes while at each decision node is the branch associated with the highest payoffs.

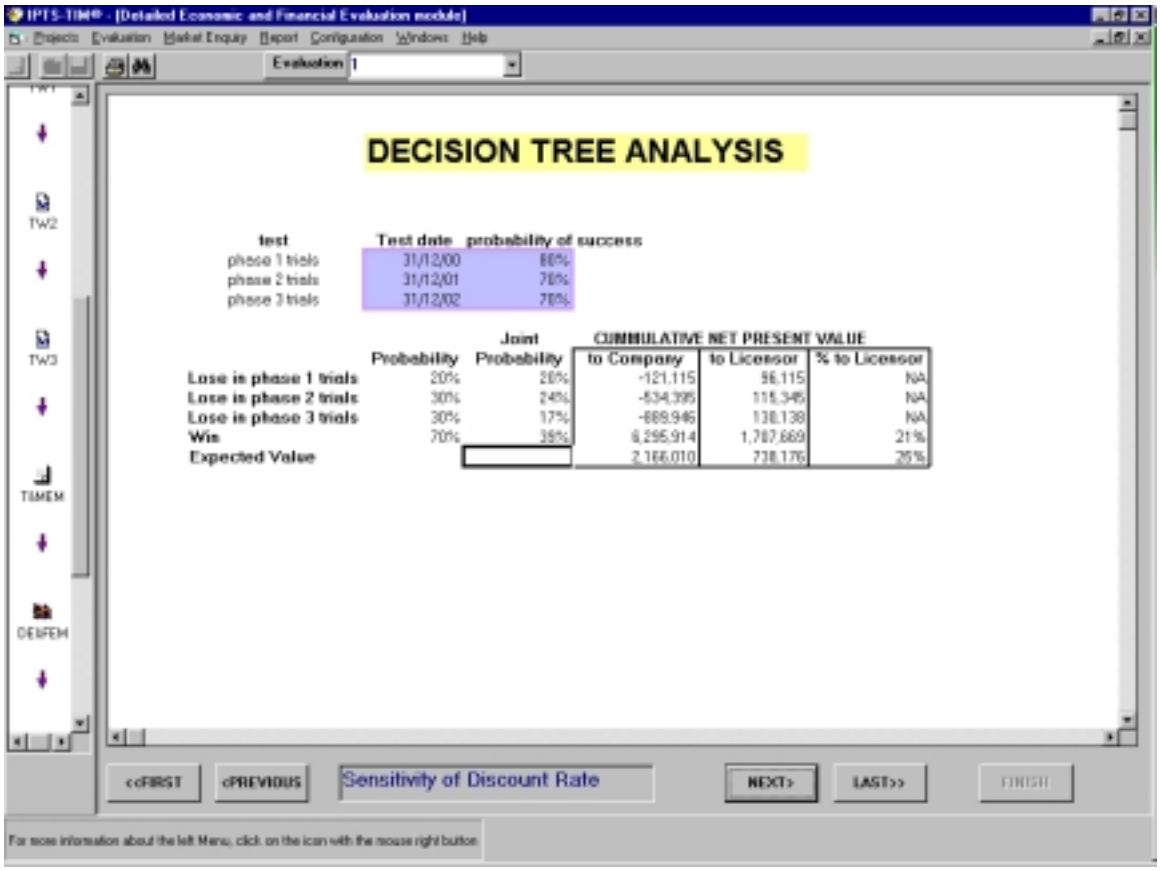
The simplest approach to incorporate a time factor in tree analysis is introducing all the cash flows in the form of discounted cash flows from the initial decision point.

Decision trees are used to reproduce sequential decision problems under uncertainty. The following Figure provides an illustration of a decision problem.

Operation of decision Tree Analysis

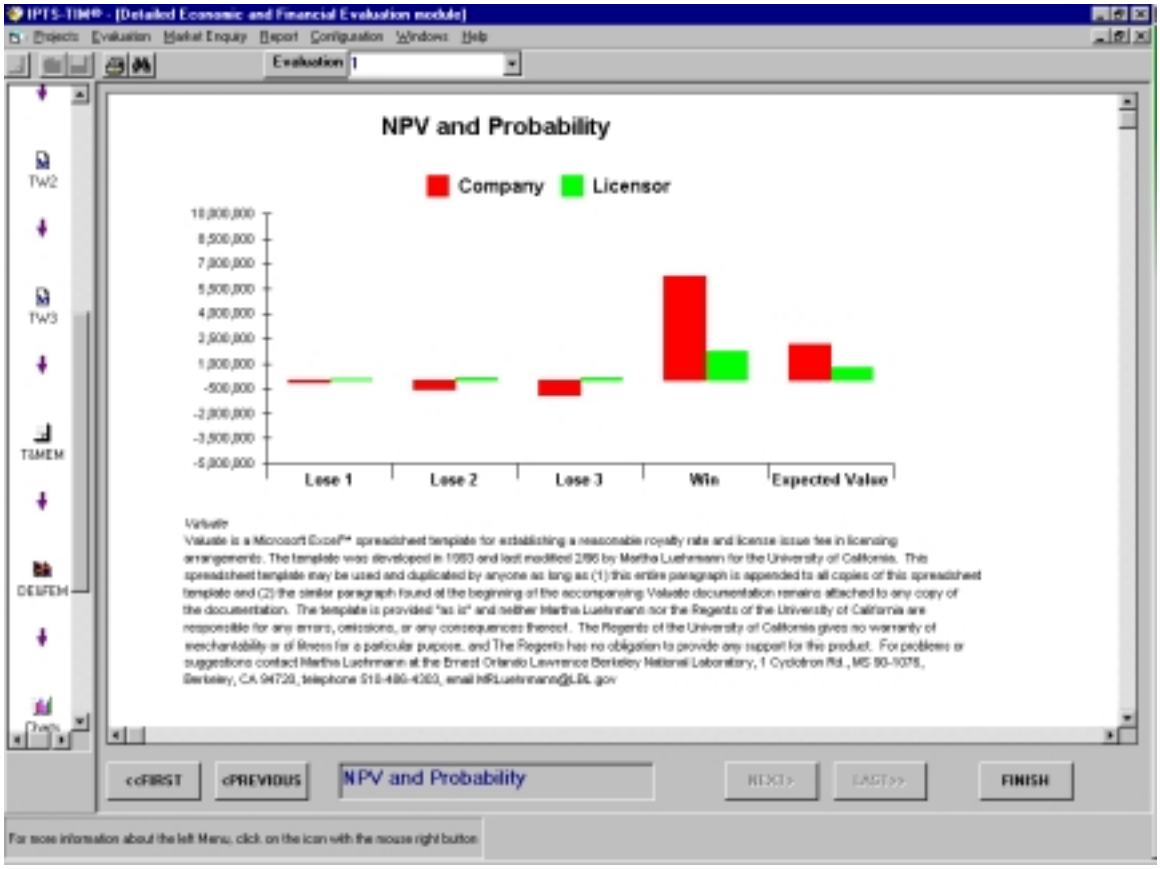
The user should provide the dates and the probability of success of the critical trials involved in the technology industrial production and demonstration phases. The program will calculate the joint probability of success at each of the trials as well as the Cumulative Net Present Value to each of the parts in the negotiation, the licensor and the licensee and the percentage the licensor represents in the CNPV.

Finally, the program will compute the expected value of the overall project taking into consideration the critical trials involved.



Step 8: Net Present Value (NPV) and Probability

A Figure plots in a bar diagram the results of the decision tree analysis provided in the previous screen



13. Final Evaluation Index (FEI)

13.1. Introduction

The Final Evaluation Index (FEI) is a module combining the results of the "Technology and Market Evaluation" Index and the "Detailed Economic and Financial Evaluation" Index. The formula to calculate the Final Evaluation Index defines a weighted average of the T&MEM Index, which is based on purely qualitative information as a primary source, and the DE&FEM Index which is based on quantitative information as a primary source.

The formula to compute the Final Evaluation Index (FEI) is

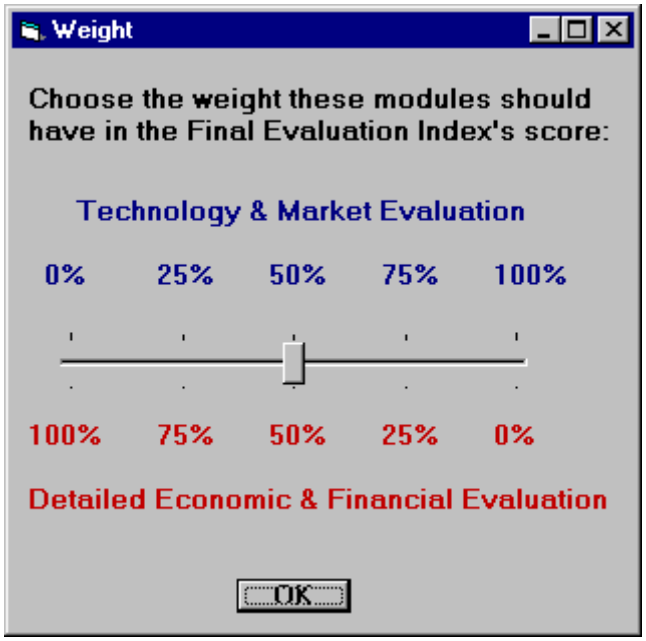
$$FEI = w_{STI} \quad STI + w_{FEV} \quad FEV$$

where STI is the scoring table index and w_{STI} is the weight applied to this index and FEV is the Financial and Economic Evaluation Index and w_{FEV} is the weight applied to the Financial and Economic Evaluation Index.

13.2. User guide

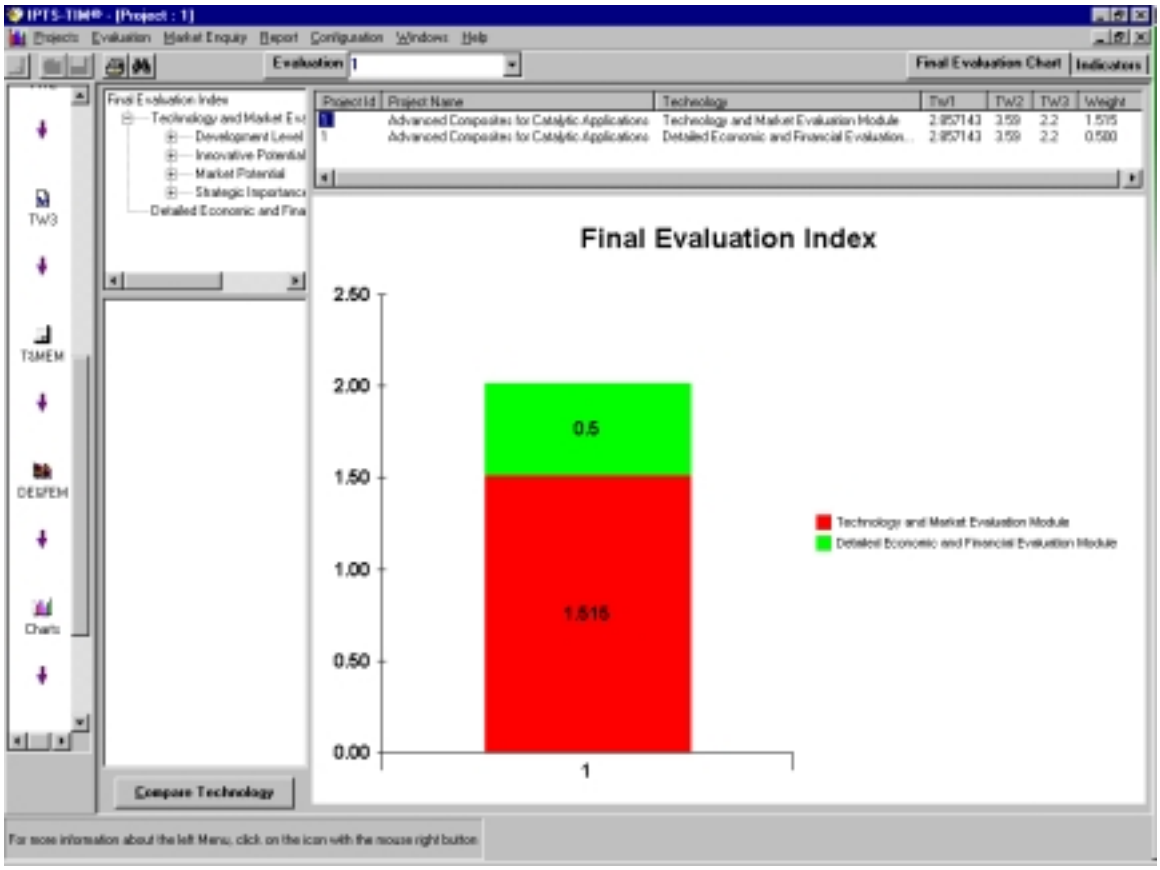
To access this module, click on « Charts» in the left menu.

The following screen will then appear:



This screen allows you to input the relative weights that T&MEM and DE&FEM should have in the Final Evaluation Index's score.

To continue click on "OK" and then select, in the following screen, a chart type. Then a similar screen will appear:



14. Software configuration

This menu concerns the application parameters. To access to it, please go to the "Configuration" menu. It should be carefully used because it allows the user to access the database structure and the T&MEM. Furthermore, Technologies Watch 2 calculations can be as well modified.

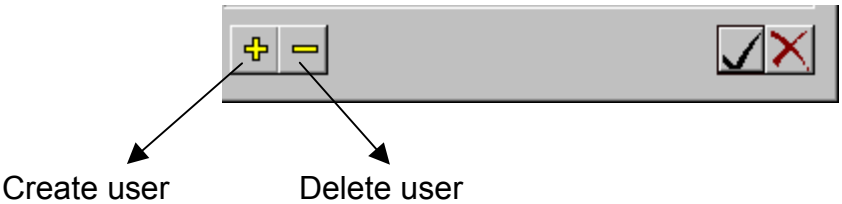
14.1. User Manager

This screen allows you to add, modify and delete the information about the software's user.

There are 2 types of users:

- Normal user
- Super user

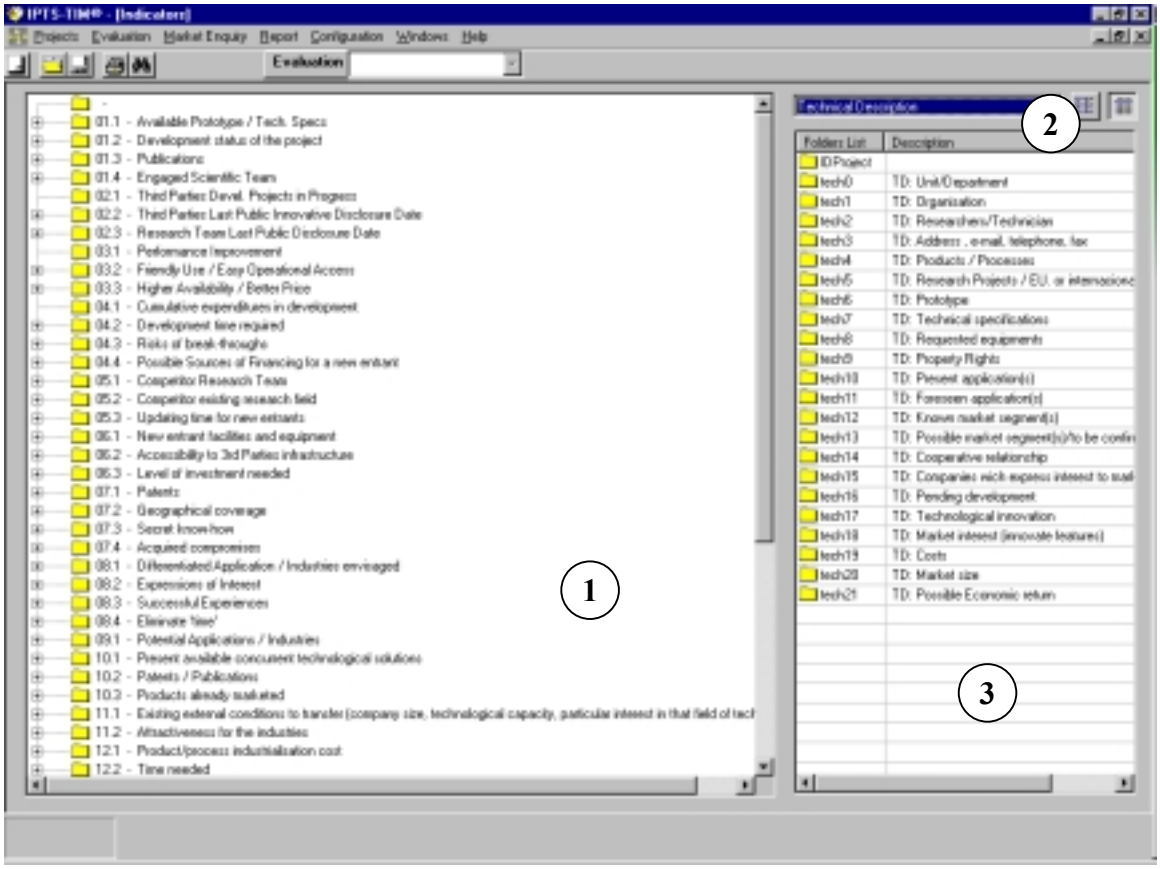
The "super user" can access all the software' functions. The "normal user" has fewer options; he/she is limited mainly to the consultation of information and cannot modify it.



14.2. Information on the T&MEM indicators

When the user enters information on the T&MEM module to evaluate a technology/project, he/she can, at any time, use the « info » button to consult the concerned indicators/evaluation criteria they are referring to, and in which module have been used, while evaluating the technology/project.

This screen shows the indicators/evaluation criteria and the origin of the information (from Technical Description and Market Enquiry modules) and the availability (of specific information).



(1) 53 indicators/evaluation criteria of the "Technology & Market Evaluation Module"

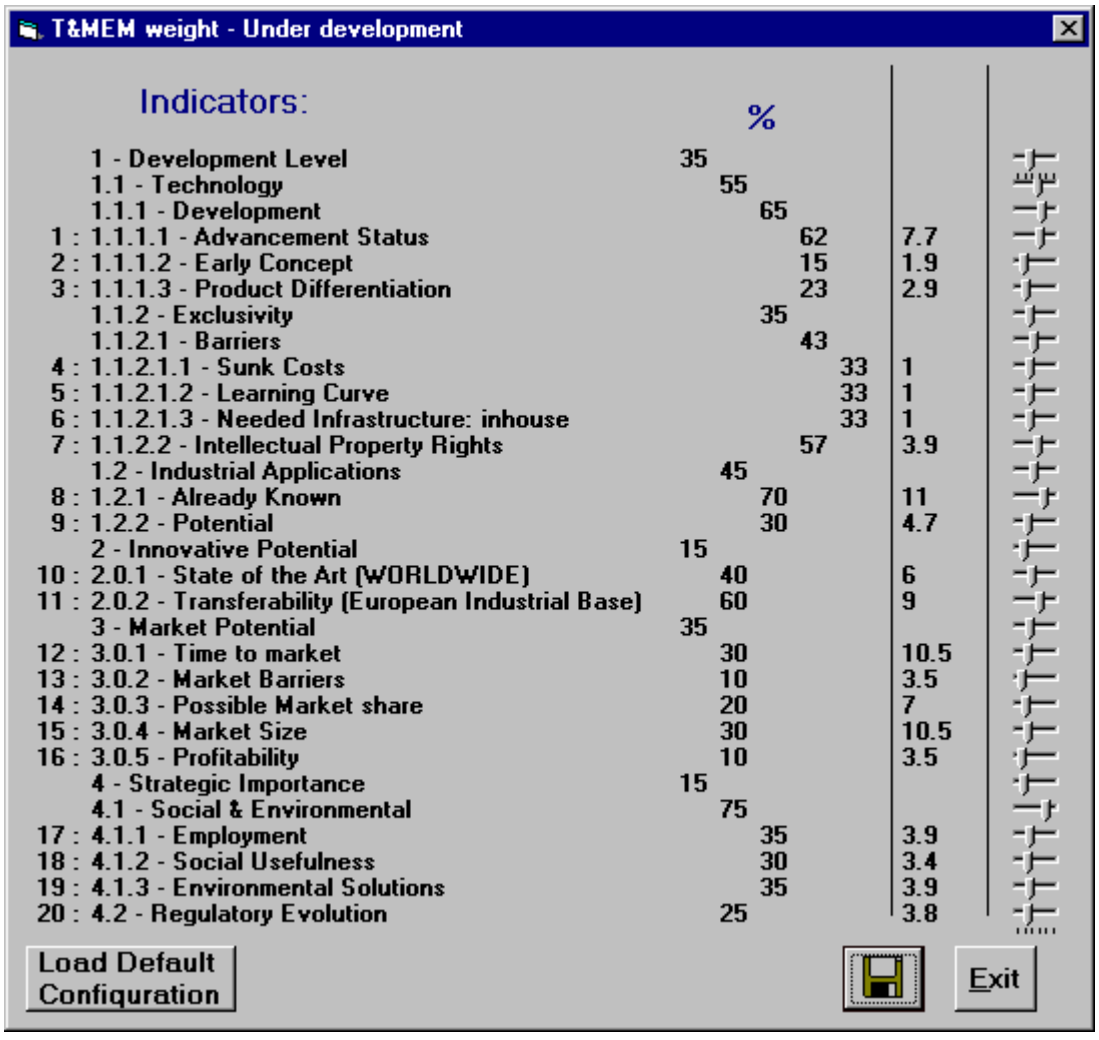
(2) Origin of information (i.e. from Technical Description and Market Enquiry modules)

(3) The relation/links between areas of input information (see figure, right column) and the indicators (see figure, left column) is already initialised by default. If you would like to modify it, you can do so through a simple operation:

On the right-hand side of the menu/list, select the origin of the information, as for example, « Technical Description ». On the menu/list, all the names of the available origin-fields will come up. To add a field of a specific question into the T&MEM, please select the field and drag it to the element of the T&MEM on the menu-list. If an element is not correctly placed, please select it on the menu-list on the right-hand side and press the « Suppr » button on your keyboard to delete it.

14.3. Change T&MEM Indicator Weights

If you want to apply different T&MEM indicator weights to **ALL technology or project evaluations** to be evaluated, go to « Configuration » menu, « T&MEM» and click on « Weights ».
The following screen will then appear:



You can now change the weights by simply moving the little bars that are located in the right part of the screen.

If you want to apply these changes to **only ONE technology or project evaluation**, you must open the Technology/project file first from the main menu, and then click on «Weights» in the left menu. The changes will be applied only to that Technology/project evaluation.

15. Contact Information

For additional information, or for any suggestion you may have, you can contact the European Commission's JRC-IPTS by sending an e-mail to: IPTS-TIM@jrc.es or writing to the following address:

European Commission
Joint Research Centre
Institute for Prospective Technological Studies
W.T.C., Isla de la Cartuja s/n, 41092 Sevilla (Spain)
www.jrc.es

APPENDIX 1 to the *IPTS-TIM*© User's Manual

T&MEM Indicators and their Default Factor Scales Definition

Indicator 1: Advancement status/Technological progress

Measurement of the advancement reached by the researchers in the considered technology development, considering technology innovation as the OECD (Oslo Treaty manual) approach – new product, production process, delivery process, service or methodology. It is done through four factors:

1. Concrete results availability with a clearly established functionality, as prototypes in the case of process or product technologies, or as a well defined set of detailed technical specifications allowing the construction of a prototype or the supply of technology services (materials properties characterisation, e.g.). The finishing level of that prototype or the technological specifications readiness are to be considered among the most important evaluation elements, because they involve not only the reduction of further technology industrialisation expenditures, but even the own technology credibility in relation with the market.

2. The number and kind of RTD projects developed by the organisation in order to obtain or to validate the considered technology is another of the factors. It is important not only to validate the in progress or accomplished projects, but even the projects orientation: applied focuses as different to more fundamental or basic research focused projects, which have different meaning when confronted with the results exploitation.

3. The existence of scientific and technical papers is another complementary factor in the evaluation, being the elements to consider not only the kind of documents published (preliminary reports or the result of research accepted by scientific journals), but also their basic science- or technology orientations.

4. The engagement and availability of a scientific research team is linked to the possibility of answering any demand of going ahead with the development or of modifying it to get a more suitable result to be transferred.

Fac-tor	1.1.1.1. ADVANCEMENT STATUS (1)	0	1	2	3	4	5	Weight	Source
1.1	**Available Prototype / Tech. Specs**	Not defined	Basic definition	Prototype devel. scheme	Initial prototype	Final prototype untested	Final prototype tested	35%	TD
1.2	**Development Projects**	No projects	Generic Research Projects	Applied Tech. Projects in progress	Completed Applied / Tech. Development Projects	Validation Projects/Projects under Contract in progress	Completed Validation Projects/Projects under Contract	35%	TD
1.3	**Publications**	No publications	Congress papers submitted	Congress proceedings	Scientific Publications	Technical Reports disclosed	Dissemination Publications.	10%	TD
1.4	**Engaged Scientific Team**	Dispersed Team	Several Teams not Fully involved	Shared / Distributed Responsibility	Engaged Senior Responsible	Consolidated Sc. Team	Scientific & Marketing Team	20%	TD

Indicator 2: Early concept

Considering the technology novelty from the market or the competence point of view involves the reference to the maturity of every development in this field:

1. Likely, the existence and the advancement level of third parties alternative projects become a reference element to evaluate the market interest or importance of the analysed technology.

2. As a complementary reference are to be considered the third parties publications, according to the time when they have been published, Three years has been chosen as the reference period to consider an accentuated decreasing of the technology importance.

3. Sharing this same point of view even more important is the coming up of new RTD papers or publications. It has been considered the readiness of new publications on a particular technology the best level to be considered as the earliest technology concept.

	1.1.1.2. EARLY CONCEPT (2)	**0**	**1**	**2**	**3**	**4**	**5**	**Weight**	**Source**
2.1	**Third Parties Devel. Projects in Progress**	Unknown	Technology available	Prototype developed	Development projects running	Exploratory Stages	No projects under development	25%	TD/TW
2.2	**Third Parties Last Public Innovative Disclosure Date**	Unknown/More than 3 years	2 yrs. < < 3 years	1 yr < < 2 years	Last 12 months disclosure	Recently disclosed (last 6 months)	Non-existent	25%	TD/TW
2.3	**JRC Last Public Disclosure Date**	More than 3 years / Unpublished	2 yrs < < 3 years	1 yr < < 2 years	Last 12 months disclosure	Recently disclosed (last 6 months)	Disclosure under preparation (approved abstract)	50%	TD

Indicator 3: Product/Process differentiation

Giving advantage to a technology to be sold is not only its ability to show new possible solutions to a determined problem, but also its differentiation related to other alternative solutions. The following factors give expression of that:

1. Performance improvement and the supply of a better quality solution show a difference between the present and other usual technologies. That improvement can refer only to functionality or mean also a qualitative change.

2. The user friendliness of the technological solution considered is an additional key element, when the requirement of a high level of technology specialization could hinder the transference possibilities.

3. Last but not least is the solution improvement as far as the availability and final price, in relation to existing technology solutions.

Fac-tor	1.1.1.3. PRODUCT/PROCESS DIFFERENCIATION (3)	0	1	2	3	4	5	Weight	Source
3.1	**Performance Improvement**	Not evident	Similar Performance	Small Improvement	Medium Improvement	High Improvement	Qualitative Improvement	45%	TD/TW
3.2	**Friendly Use / Easy Operational Access**	Very Difficult Operation	Difficult Operation	Highly skilled personnel	Specifically trained personnel	Generally trained personnel	Intuitive Operation	20%	TD
3.3	**Higher Availability / Better Price**	Unpredictable terms or costs	Not clear price or availability improvement	Similar to present supply	Light improvement in availability / price	Strong improvement in availability / price	Best Accessibility and Price	35%	TD/TW

Indicator 4: Sunk costs

The organisation research team effort spent in development is an actual entrance barrier for other possible entrants, so much important as high have been the costs and the difficulties overcome.

1. Firstly the needed expenditures to end the technology development and the possibility of recuperation through the exploitation of results.

2. The development time needed for the development, even when it could be shorter for a new entrant than the spent by the organisation RTD team, due to new knowledge available or to a new perspectives of economic results appeared.

3. Breakthrough development risks -- at one or several different process steps -- will generally be lower for new entrants as far as new information is available on the probability of final success of the technology development.

4. Accessibility to financing sources for development means an actual barrier for new entrants: accessibility to public financing will be reduced -- except in the case of a competitor supported by national or political reasons -- , and the investment decision of a competitor, being it a company or a research centre, is conditioned by the interest of the technology and the advantage situation reached by the RTD team.

Fac-tor	1.1.2.1.1. SUNK COSTS (4)	0	1	2	3	4	5	Weight	Source
4.1	**Cumulative expenditures in development**	Irrelevant	Low specifically associated costs	High probab. break-even attained	Medium probab. break-even attained	Low probab. break-even attained	Non-proportional to any expected returns	30%	TD
4.2	**Development time requested**	Irrelevant	< 6 months	6 months < < 12 months	1 yrs < < 2 years	2 yrs < < 3 years	> 3 years	25%	TD
4.3	**Risks of break-through**	Irrelevant	Low incertitude during development	Medium incertitude in one development steps	Medium incertitude in several development steps	High incertitude in one development steps	High incertitude in several development steps	30%	TD
4.4	**Possible Sources of Financing for a new entrant**	100 % Public funding	Devel. under contract	> 50 % Public Programmes funding	50 % Public Programmes funding (e.g. FP, pre-competitive stages)	< 50 % Public Programmes funding (Basic research)	RDT Total self-financing	15%	TD/TW

Indicator 5: Learning curve

The learning curve of any entrant in a new technology field, that is, the time necessary for tackling a new development in an up to then unknown technology decays powerfully with time engaged in the field. However it means a strong barrier for new possible competitors. This indicator is defined by a group of three factors:

1. The competitors' research team, its qualification and eventually its specific orientation towards the particular technology field.

2. New entrants experience and awareness with the technology.

3. The needed time to reach valuable results in the research, even when the former factors were highly qualified.

Fac-tor	1.1.2.1.2. LEARNING CURVE (5)	0	1	2	3	4	5	Weight	Source
5.1	**Competitor Research Team**	Not necessary	Common team members	Low profiled team members	Specialised team members needed	High qualification personnel	Specifically HQ trained personnel	35%	TD
5.2	**Competitor existing research field**	Not necessary	Some experience in connected fields	High experience in connected fields	General experience in the field	Specific experience in the field	Long time broad experienced research in that field	35%	TD
5.3	**Updating time for new entrants**	Not necessary	Short term research (< 6 months)	Short term research (6 months< < 12 months)	Medium term research (1 yr < < 2 years)	Medium term research (2 yr< < 3 years)	Long term research (> 3 years)	30%	TD

Indicator 6: Needed infrastructure

Finally, a new competitor could find another entry barrier to be able of developing the technology by itself: the availability of infrastructure, instruments or singular equipment needed to work:

1. Needs of infrastructure and equipment for the project development could mean for new entrants a high barrier according to their specificity for that technological field, and also depending on the lack of suppliers of the needed equipment. In the limit the difficulties would be established by the necessity to proceed to perform a specific design of the equipment needed for the technology development.

2. Likewise, the importance of the difficulties for new entrants to use third parties facilities would mean an additional barrier.

The last factor considered is the investment amount needed to get the research labs or equipment.

Fac-tor	1.1.2.1.3. NEEDED INFRASTRUCTURE (6)	0	1	2	3	4	5	Weight	Source
6.1	**New entrant facilities and equipment**	Not necessary	Fully available	Restricted access	Partially available equipment / Partial indoor development needed	Restricted access and partially available	Non available and sophisticated equipment / Fulindoor development	50%	TD
6.2	**Accessibility to 3rd Parties infrastructure**	Not necessary	Fully accessible	Easy and low cost access	Easy but high cost access	Difficult access	Non existing / Singular infrastructures existent	25%	TD
6.3	**Level of investment needed**	Not necessary	Low cost investment	Medium cost multipurpose investment	Medium cost single application investment	High cost multipurpose investment	High cost single application investment	25%	TD

Indicator 7: Intellectual property rights

Besides the access barriers to technology coming from the difficulties derived from the new entrant features, other barriers have to be considered: the level of protection of the technology:

1. The level of protection established or in progress, as patents or design registration.

2. When existing Intellectual Property Rights, the geographic coverage range. This is a factor successive to the previous one.

3. A complementary factor to the first one -- even when sometimes could be alternative --- for intellectual property protection is the secrecy: the dissemination control of the key information of the technology.

4. The positive protection for the transfer compromises acquired or the co-property diminishes the technology represented by the former factors derived from co-operation of the RTD organisation with third parties in the development.

5. The extreme evaluation of this factor ("IPR sold") meaning the losing of the technology property is ion of the constraints resulting in a "nought" for technology transfer, and so is a reason to remove it from the technologies list to be evaluated.

Fac-tor	1.1.2.2. INTELLECTUAL PROPERTY RIGHTS (7)	0	1	2	3	4	5	Weight	Source
7.1	**Patents**	Non applicable	Patentable results	Filing foreseen	Patent applied /pending	Partially patented technology	Fully patented technology	40%	TD
7.2	**Geographical coverage**	Non applicable	1 country	Several European countries	E.U.	E.U and/or USA and/or Japan	World-wide	15%	TD
7.3	**Secret know-how**	Openly disclosed	Openly disseminated information in scientific circles	Well known information among specialists	Restricted access to information	Access limited to the research team	Very limited number of persons acquainted under confidentiality contract	30%	TD
7.4	**Acquired compromises**	I.P.R. sold	Exclusivity rights temporarily granted	Licensed, non exclusively, rights	Shared I.P.R. (as project result, e.g.)	Collaborative result of research	Exclusive ownership	15%	TD

Indicator 8: Applications already known

One of the keys to the success in the technology transfer processes is derived from the functionality of the technology for the applications to that is oriented. As far as the already known applications are concerned -- even when there has not been a validation of the technology -- there are the following factors to be considered:

1. The number of different applications to be addressed, and the industry sector where they could be of interest. Clearly a new sector can supply new perspectives of growth to a particular technology already applied in other sectors.

2. The actually established links with companies of possible interest for transference of the technology, and the kind of expressions of interest (contracts, project co-operation, generic relationship) coming from the industry.

3. The attained success in the concrete application of the technology, happening under very different conditions, from the research premises to a real and more restrictive industrial environment.

4. The validation process to overcome from the present situation onwards.

Fac-tor	1.2.1. APPLICATIONS ALREADY KNOWN (8)	0	1	2	3	4	5	Weight	Source
8.1	**Differentiated Application / Industries envisaged**	Unknown / No confirmed application field	One application identified in restricted fields (e.g. nuclear)	One identified application sector	Several identified applications / sectors	Deeply known or specific application / sector	A broad field of present applications	30%	TD/ME
8.2	**Expressions of Interest**	Non-existent	General expression of interest by one or more companies	One company collaborating in research	Several companies collaborating in research (e.g. FP)	One company engaged under contract	Several companies engaged under contract	30%	TD
8.3	**Successful Experiences**	Non-existent	Own laboratory positive results	Success on a collaborative project	Pilot development under contract	Tested under industrial conditions	Certified product ready for market	20%	TD
8.4	**Validation period**	Not defined	Long time period of validation (> 1 yr) pending	Medium time validation period pending (1 year> > 3 months	Short period of validation pending (< 3 months)	Industrial validation finished	Market validated product	20%	TD

Indicator 9: Potential applications

This indicator has not associated factors separated, and has a successive coverage with the former Indicator 8. It only refers to generic and not confirmed technology applications.

Fac-tor	1.2.2. POTENTIAL APPLICATIONS (9)	0	1	2	3	4	5	Weight	Source
9.1	**Potential Applications / Industries**	Unknown	One general application conceived	Several general applications expected	One potential field of application detected	Several possible fields of application detected	Wide field of possible applications (not confirmed)	100%	TD/ME/TW

Indicator 10: State-of-the-art

In former indicators the referred technology was the one developed by the organisation itself. On the contrary, in this case refers to the development situation of the competitors; therefore the assigned marks in the scales corresponding to the different factors are contrariwise proportional to the fulfilment of the commented situations.

1. The evaluation corresponding to the technology through this factor is also inverse to the suitability and the advanced level of the similar solutions found in the market.

2. Likewise happens to the existing protection for similar solutions. In relation to this factor only when there is a certainty on the non-existence of similar developments, the lack of information on the technology involves a high mark to be assigned.

3. Lastly, the existence of products or technological services in the market is the element that can allow positioning the analyzed technology related to the "de facto" state-of-the-art.

Fac-tor	2.0.1. STATE-OF-THE-ART (WORLDWIDE) (10)	0	1	2	3	4	5	Weight	Source
10.1	**Present available concurrent technological solutions**	Advanced concept solutions fully adequate provided	Evolutionary solutions	Conventional technologies available	Partial technological solutions existing	Advanced generic solutions researched	No technological solutions envisaged	20%	TW
10.2	**Patents / Publications**	Patented technology / Not applicable	Partially protected technology	Detailed technical information published	Papers published with general information	Congress information disclosed	No information existent	30%	TW
10.3	**Products already marketed**	Mature products on supply	Recently marketed products	Already announced products, not available	Partially equivalent products available	Alternative, lower-grade products available	No product marketed	30%	ME/TW

Indicator 11: Transferability

This indicator refers to the possibilities of technology transfer according to the characteristics of the industrial space (especially the European). The possibilities of exploitation of a technology are linked to the possibility of finding an adequate environment at the moment when the technology is ready for the market and represents an innovative input in that industrial environment.

1. Existence in the region of adequate companies, from the perspective of their technological, commercial and financial capacity, specially the existing relationship between them and the organisation.

2. Technology attractiveness for industry can be evaluated as a function of the reaction registered coming from those companies that have been involved in this particular development.

Fac-tor	2.0.2. TRANSFERIBILITY (EUROPEAN INDUSTRIAL BASE) (11)	0	1	2	3	4	5	Weight	Source
11.1	**Existing external conditions to transfer (company size, technological capacity, particular interest in that field of technology)**	No company identified	Generally identified companies	One company with the right profile (size, capacity), in contact	Several companies with the right profile, in contact	One company collaborating on commercial developments.	Several companies collaborating on commercial developments.	45%	ME/TW
11.2	**Attractiveness for the industries**	Rejections registered	Objections registered	Not direct confirmation of interest	More than one expression of interest	Negotiations on TT engaged	Partial TT agreements attained	55%	ME/TW

Indicator 12: Time to market

The ever-diminishing terms for industrial exploitation of research results expose the value of the time-to-market for the technology that has ended its pre-competitive development stage. Factors included in this indicator are in practice inverse to those contained in Indicator 4 (Sunk costs). There was mentioned the importance of the factors for third parties trying to compete with the RTD organisation. Here the same importance makes reference to the analyzed technology.

1. Transforming technology in a marketable product or process, what is called industrialization process, involves costs often much higher to transference costs and even to development costs, and underestimate them results very often in the failure of technology transfer negotiation.

2. The same could be said in relation to the needed time for suitability of the technology to the market.

3. The failure risks in this process are closely linked to the development level of the transferred technology, which is very different according to every kind of them.

Fac-tor	3.0.1. TIME TO MARKET (12)	0	1	2	3	4	5	Weight	Source
12.1	**Product/process industrialisation cost**	Not quantifiable / extremely high costs	Relevant / higher than TT costs	Similar to TT costs	Costs lower than the TT cost	Low-relevance costs	No additional costs	40%	TD/MA
12.2	**Time needed**	Not quantifiable / extremely long time	Time between 2-3 yrs.	Time between 1-2 yrs.	Time between 6 months and 1 yr.	Time less than 6 months	Ready to use technology	35%	TD/MA
12.3	**Risk of breakthrough in industrialisation**	Undetermined risks	High risk foreseeable	Valuable risks	Measurable risks, accurately evaluated	Incidental risks	Certified / Standardised technology	25%	TD/MA

Indicator 13: Market barriers

The market barrier indicator evaluates the hindering factors in technology transfer coming from the demand market features or from technology users, and likewise those factors derived from the technology marketable features.

1. When the number of companies possibly interested in the technology is very small (that even can be interested in a gradual arrival to the market, according to their own position in it) the evaluation of the technology is very different to the opposite situation: a completely open market.

2. Knowledge on the technology or its functionality disseminated in the industry can favour the technology transfer, being the process much more difficult when there is no awareness on the proximity of the technology to the solution of concrete problems.

3. Versatility as a quality of the technology and its complementary character to other existent and already applied technologies represents an important advantage for it.

4. Use of technical barriers, coming from specific regulation or from "de factor" standards laid by the market continues to be one of the main constraints to enter new markets, including the technology market, in spite of the European Union and other institution efforts.

Fac-tor	3.0.2. MARKET BARRIERS (13)	0	1	2	3	4	5	Weight	Source
13.1	**Monopoly situation in the market**	World demand monopoly	Monopoly situations in several regions / sectors	Dominant position of a restricted group of companies	Regional / Sector dominant position	Well positioned suppliers	Openly accessible market	40%	ME/TW
13.2	**Users awareness with the technology**	Undetected or non-formulated links between the technology and existing problems	Solutions expected in that particular development line	Partial awareness of the possible users with the technology	Knowledge of previous stages of development	Generalised dissemination of simpler solutions in the same technological field	Knowledge and general acceptance of the technology	15%	ME/TW
13.3	**Technology specificity and complementarity**	Insufficiently defined / known applications	Extremely specific users / applications	One well defined application	Several well defined users and applications	Wide number of users in several applications	Wide versatility	15%	TD/ME
13.4	**Technical Barriers**	Strictly established regulations / previous certification needed	Defined period to obtain certification	*De facto* standard to be fulfilled	Best practices widely established	Current supplier(s) solutions well known	Non-existent	30%	TD/ME

Indicator 14: Possible Market Share

According to the features of the foreseeable application markets, and specially the presence of other technological solutions providers, the relative importance of the RTD organisation technology should be considered, and therefore a possible market share to be attained. There are evident difficulties to perform this evaluation, although it is necessary to attain a correct evaluation of the technology.

Fac-tor	3.0.3. POSSIBLE MARKET SHARE (14)	0	1	2	3	4	5	Weight	Source
14.1	**Exclusivity (Foreseeable market share)**	Negligible share	Numerous suppliers	Small number of suppliers	A few likeky suppliers	Potential suppliers identified	Highly exclusive situation / slave market	100%	ME/TW

Indicator 15: Market size

When referring to the market size of the technology it is meant the collection of problems that could be solved optimally by it. Therefore a wide estimation of the different markets where the technology is oriented is to be done:

1. The independent consideration of the European market is coming from its specific character related to other markets as the American or the Japanese, but most importantly due to its proximity and the policy orientations given to the organisation research. Even more, this concept of proximity applies especially to technological services.

2. The rest of the world markets are analyzed from the same view as the European, although only for some technology accessibility and proximity play the same role as in Europe.

3. The market growth refers only to those most relevant for the considered technology, being in general European markets.

Fac-tor	3.0.4. DEMAND/MARKET SIZE (15)	0	1	2	3	4	5	Weight	Source
15.1	**European market size**	Non-existent	Emerging market	Small sized market	Medium sized market	Big sized market	High proximity big size market	40%	ME/TW
15.2	**Extra-European market size**	Non-existent	Emerging market	Small sized market	Medium sized market	Big sized market	High proximity big size market	30%	ME/TW
15.3	**Market growth rate**	Disappearing / Undefined	Decreasing	Up & down / Non-existent but promising market	Stable	Slow / sustained growth	High growth rate	30%	ME/TW

Indicator 16: Profitability

Profitability measurement coming from the technology to be sold refers to the return obtained compared with the costs relative to the different development stages.

Fac-tor	3.0.5. PROFITABILITY (16)	0	1	2	3	4	5	Weight	Source
16.1	**Expected economic return according to RTD investment**	No economic return	Return under marginal investment	Return covering marginal investment	Return covering total RTD investment	Positive benefits in the operation	Highly profitable operation	100%	ME

Indicator 17: Employment

In the European policies, the creation of jobs is one of the main objectives. Introduction of new technologies has not always positive effects on employment, therefore the evaluation of the foreseen impact on employment is of special interest.

1. On one side is to be considered the impact on the direct or indirect employment derived from the production processes generated or the new business initiatives coming from the application of the technology.

2. Secondly, the qualification of the jobs, from low levels in manufacturing up to the continuation of the RDT activities in the industry, and in the best of the situations when new business are created (spin-offs) for the exploitation of the technology.

Fac-tor	4.1.1. EMPLOYMENT (17)	0	1	2	3	4	5	Weight	Source
17.1	**Employment generated**	No new employment	Consolidation of the concerned jobs	Small number of direct jobs (<10)	Medium number of direct jobs (50 < <10)	Large number of direct & indirect jobs (>50)	Large number of new jobs, including differentiated groups of workers	60%	ME/TW
17.2	**Quality/specialisation of the employment**	Unqualified / Not applicable	Manufacturing low qualified jobs	Laboratory personnel and technicians	Professional employment (design engineers, e.g.)	Highly qualified (research, management)	Spin-offs	40%	ME

Indicator 18: Social usefulness

In the same framework of European policies, the social usefulness is to be checked in relation to its contribution to the solution of quality of life, health (healthcare, consumer nutrition, quality of life for elderly and disabled, education and culture and other aspects) and safety problems. In this indicator two factors are included:

1. First, the social importance of the problems that could be solved with the application of the technology.

2. Second the consideration of the importance of the technology to support or contribute to a solution.

Fac-tor	4.1.2. SOCIAL USEFULNESS (18)	0	1	2	3	4	5	Weight	Source
18.1	**Importance of the social problems envisaged**	Not applicable	Low relevance	General improvement of quality of life	Incidence in the solution of a particular problem	Very important health & safety problem	Several important health & safety problems	40%	TW
18.2	**Contribution to the solution**	Not applicable	Low relevance	Support to partial solutions of the problem	Partial solution	Significant partial solution	Full solution	60%	TW

Indicator 19: Environmental solutions

Similarly to the former indicator, contributing to the solution of the environmental problems (reduced pollution, noise or radiation, preservation of natural heritage and resource management, production and rational use of energy and other aspects) in the frame of European policies has a wide incidence to be considered in the evaluation:

- Because of the importance of the considered environmental problems.
- Due to the potential contribution of the technology to support or provide solutions to defined problems.

Fac-tor	4.1.3. ENVIRONMENTAL SOLUTIONS (19)	0	1	2	3	4	5	Weight	Source
19.1	**Importance of the problems envisaged**	Not applicable	Low relevance	General improvement of environment	Incidence in the solution of a particular problem	Very important environmental problem	High environmental impact problems	40%	TW
19.2	**Contribution to the solution**	Not applicable	Low relevance	Support to partial solutions of the problem	Partial solution	Significant partial solution	Full scale solution	60%	TW

Indicator 20: Regulatory evolution

A great number of technologies are oriented towards fields where the role of the public regulations favours their incorporation to industrial process and products. Therefore the analysis and evaluation of the public regulation processes in the fields where the technology can apply, from the very moment when a social consciousness of the problem appears until the moment when a legal act is promulgated, is relevant for an adequate evaluation.

Fac-tor	**4.2 REGULATORY EVOLUTION (20)**	**0**	**1**	**2**	**3**	**4**	**5**	**Weight**	**Source**
20.1	**Action trends in (new) regulation in application fields of the technology**	Not applicable	Social concern	Political involvement	Regulatory technical committees at work	Drafts of regulatory measures	Operating regulations	100%	TD/TW

APPENDIX 2 to the *IPTS-TIM*© User's Manual

Full Market Enquiry Questionnaire

THE AIMS OF THE PRESENT QUESTIONNAIRE ARE:

- to get a valuable opinion/evaluation of the marketability potential of a new technology (appropriate information is provided with the questionnaire) form a real player, - industrialist, distributor and dealer- , in the market
- to inform the industrialist on a possible transfer of the proposed new technology and receive its manifestation of interest
- to obtain any other possible useful information on the proposed new technology about alternative application/markets, possible improvements, other companies which might be interested, etc.

A. General Information of the respondent's Organization

1. Name of the Company

2. The questionnaire respondent's company belongs to the following main shareholder(s) (if applicable)

3. Main SECTOR(S) (NACE classification, 3 digits) of Activity (maximum 3 entries; JUST THE NACE CODES)

4. Name(s) of the respondent(s)

5. Job Title/Position

6. Contact Information (address, tel, fax, e-mail, web page)

B. Information about the respondent's Company

1. **Annual Turnover**
   - □ < 10 Million EURO
   - □ 10 to 50 Million EURO
   - □ 50 to 500 Million EURO
   - □ > 500 Million EURO

2. **Number of employees**

- □ < 10
- □ 10 to 50
- □ 50 to 500
- □ > 500

3. Research and Technological Development (RTD)

3.1. Main Field(s) of RTD activity (maximum 3, by priority order)

3.2. Type of RTD activity

- □ Mainly basic research
- □ Targeted research
- □ Both basic & targeted research and technological development
- □ Mainly, market oriented technological development of research ` results

3.3. RTD staff (number of scientific and technical employees)

- □ < 10
- □ 10 to 50
- □ 50 to 500
- □ > 500

3.4. Annual RTD budget

- □ < 200 thousand EURO
- □ 200 thousand to 1 million EURO
- □ from 1 to 10 million EURO
- □ > 10 million EURO.

3.5. Positioning of your strategic market

- □ Regional
- □ National
- □ European
- □ World-wide

4. Technological co-operation with other organisations

4.1. Joint patent ownership

- □ yes
- □ no

4.2. Experience participating in technology intensive mergers, joint ventures, transfer of technologies to third companies

- □ yes
- □ no

4.3. Participation in European RTD programme/ projects

□ yes
Please, provide the title the most significant projects and name of the European RTD programmes: ……..
□ no

4.4. Organisation past experience in any type of RTD co-operation
□ yes
Please provide the name of the organisations with which you co-operate more frequently ……..
□ no

4.5. Any previous co-operation or contact with the organisation which developed the proposed new technology
□ no
□ yes, please specify in which issue …….

C. Assessment of the proposed technology

5. Technological SWOT of the proposed technology

5.1. Advantages
□ no
□ yes, please specify in which issue…….
□ unknown

5.2. Disadvantages
□ no
□ yes, please specify in which issue…….
□ unknown

5.3. Opportunities
□ no
□ yes, please specify in which issue…….
□ unknown

5.4. Threats
□ no
□ yes, please specify in which issue……
□ unknown

6. Technical specifications needed in order to be commercialised (minimum requirements)
□ no; the present specifications already fit market requirements
□ yes, modifications needed to fit the market requirements please specify in which ……
□ unknown

7. Degree of maturity of the proposed technology

□ no major development effort is envisaged
□ important development tasks should still be undertaken
please, specify :……..

8. Market interest

8.1. Novelty: Is the technology proposed really new (problem solving/fit demand deeds)
□ yes
□ no

8.2. Field of application
□ Same as already figured out by the new technology developer/traditional field
□ There are /could be NEW fields envisaged of application; please, specify : …….

8.3. Expected/present market size of application WORLDWIDE
□ < 200 thousand EURO
□ 200 thousand to 1 million EURO
□ from 1 to 10 million EURO
□ > 10 million EURO.

8.4. Expected/present market size of application EUROPE
□ < 200 thousand EURO
□ 200 thousand to 1 million EURO
□ from 1 to 10 million EURO
□ > 10 million EURO.

8.5. Commercial threshold price (average price of competing technologies in the market)
□ ……..(in EUROs)
□ unknown

8.6. Known competitors for the industrial segment of the technology
□ no competition
□ low competition
□ medium competition
□ high competition

9. Pre-commercial issues

9.1. Potential investments required to adapt technology to industrial production

- □ No investment are needed to adapt technology to industrial production
- □ Yes, investment are needed to adapt technology to industrial production:
  - □ < 100 thousand EURO
  - □ > 100 thousand to 500 thousand EURO
  - □ from 500 to 1 million EURO
  - □ > 1 million EURO
- □ Unknown

9.2. Foreseen potential time to market for the technology

- □ < 6 months
- □ > 6 months to 1 year
- □ >1 year to 2 years
- □ > 2 years

9.3. Provide a judgement for the degree of uncertainty assumed under the commercialisation phase of the technology

- □ none
- □ low
- □ medium
- □ high

10. Manifestation of Interest of your organisation in the proposed technology

- □ None
- □ Weak
- □ Medium
- □ Strong

10.1. Provide your interest for a particular form of transfer scheme for the current technology

- □ License
- □ Transfer of the technology
- □ Development in cooperation
- □ Training
- □ Service

10.2. Interest in receiving more detailed information on the technology

□ Yes □ No

10.3. Interested in scheduling an appointment with the developers

□ Yes □ No

11. Suggestion for other contacts (e.g. other potentially interested companies)

□ No

□ Yes. Please provide the organisation's name and the contact information:

……..

Institute for Prospective Technological Studies
European Commission - Joint Research Centre

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