iBaan ERP 5.0c

Explanatory Document Probability Analysis enhancement

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About this document

This document explains the Probability Analysis functionality, which has been added in release iBaan ERP Service B50c.

1 Functional Explanation

Introduction

In order to improve the service to the customers and reduce the time taken in exploring the various solutions to solve the reported problem, the call taker and the field service engineer have the facility to select the solution based on probability.

Probability Analysis is defined as the probability that a specific solution will resolve a known problem. It is based on data captured from the normal process of documenting service calls and field service.

When a call taker enters the problem code and equipment details when registering a call, the call taker does not have the facility to use the service history to take a decision about the resolution nor the probability of resolutions solving the reported problems.

The call taker would like to have these capabilities:

- View the resolutions along with the associated probability for that particular problem. The resolution details in the call can be filled by selecting a resolution from the presented resolutions.
- View the problem codes and solution codes based on the equipment type as this makes easy for him to select the right problem and solution codes.
- Report the Problem and Solution by the 'Role': Differentiate when reporting the Problem between (Customer Reported) Symptom, (Support Agent Expected) Cause and the (Field Engineer Established) Condition. Similarly differentiate when reporting the Solution between (Support Agent Expected) Solution and (Field Engineer Performed) Action.

With this enhancement BaanERP Service 5.0c will have the possibility to better support reporting of Problems and Solution and visualize the resolutions for a problem with the probability information (based on the statistical history of the real usage of resolutions for a problem).

Functional description

Parameter to Update the Call/Service Order Activity

The basic intention of visualization of Probability is to help Users (Call Agents, Support Agents, etc) to identify effective resolution strategies based on the historic recording of Problems and Solutions. There are two approaches to reporting Problems and Solutions:

1. Basic Reporting:
   Only ONE Problem and ONE Solution Code captures the issue at hand correctly and completely.
2. Advanced Reporting:
   The correct diagnosis is based on a combination of Customer Reported Symptom, Expected Problem Area, Direction for Solution, Established Condition and Action Taken

Which of the above described approaches is most applicable is an implementation decision.

When the user double clicks a record in the Probability Analysis (tsclm3561m000) session, the session will be closed and the fields expected problem, expected solution, and the reference activity are updated in the Calls/Service Order Activity with the values of the selected record.

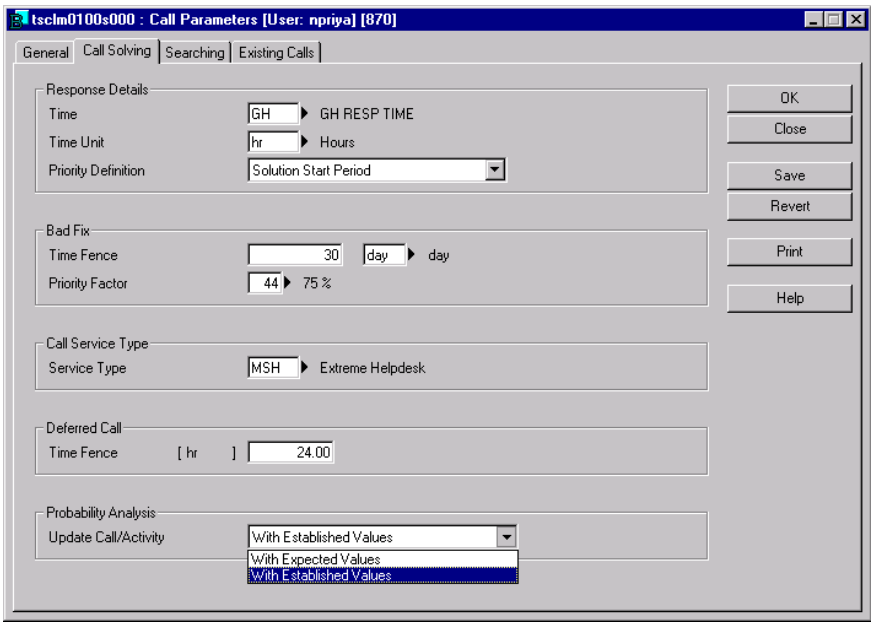
Based on the chosen approach (Basic/Advanced), the working of the system in defaulting an expected problem and expected solution will differ. This is based on the parameter for updating the Expected values of the Problem, Solution and the Reference Activity of the Call/ Service Order Activity.

The possible values for this parameter are Expected Values or Established Values.

- For Basic Reporting:
  When the parameter is 'Established', the Expected values of the Problem and Solution, of the Call/ Service Order Activity are updated with the Established values of the Problem and Solution of the Probability Analysis session. The assumption is that the Established Values form the history describe Best AND Completely the expected Resolution for the new case.

- For Advanced Reporting:
  When the parameter is 'Expected', the Expected values of the Problem and Solution, of the Call/ Service Order Activity are updated with the Expected values of the Problem and Solution of the Probability Analysis session. The assumption is that the final Problem Condition and Action can not be determined by the User in advance (only afterwards), but adding the Expected Problem Area and Direction for Solution supports best and completely the expected Resolution for the new case.

The parameter: "Update the call / Service order activity from Probability Analysis with" can be found in the Call Parameters (tsclm0100m000) session (form tab "Call Solving") as shown in the following figure:



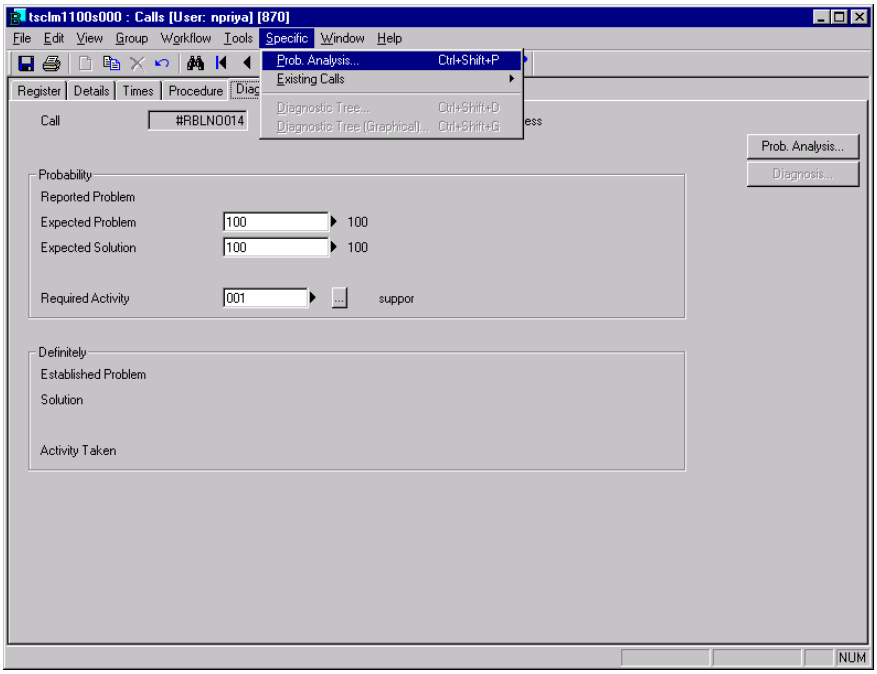
Call Parameters(tsclm0100m000), Call Solving tab

Starting Probability Analysis

The Probability Analysis session can be started from many places:

From Calls(tsclm1100s000)

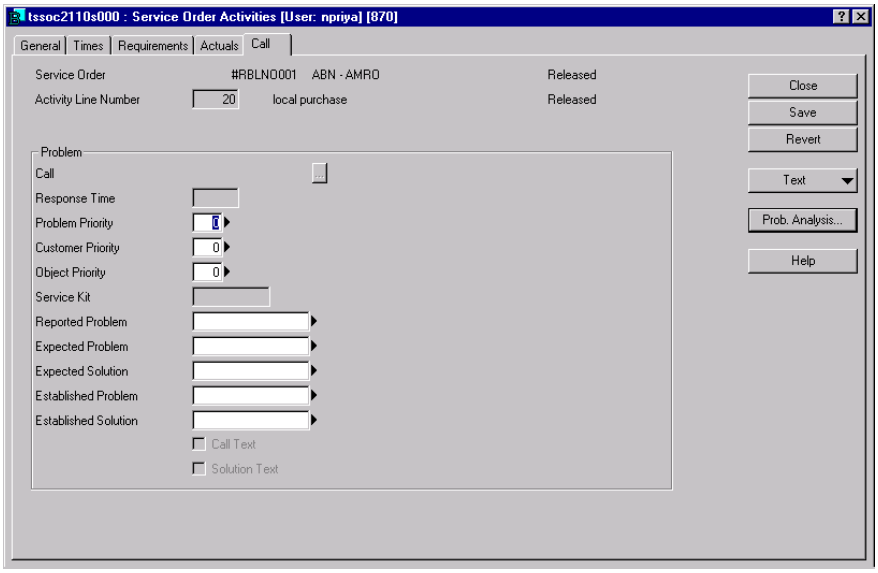
Probability Analysis can be started from the 'Diagnosis' form of the Calls session. Based on the values available for the Reported problem, Expected Problem, reference Activity, Model (Item), Item Group, Call Group, and other details, the probability results are displayed. The user can double click on the record which has the maximum probability of resolving the reported problem. The session closes and the activity, expected values of the problem and solution of call are updated with the activity, expected/established values of the problem and solution from the Probability Analysis.



Calls(tsclm1100s000) Diagnosis Tab

From Service Order Activities Details(tssoc2110s000)

New fields are added in the Call Tab of Service Order Activities. They are Expected Problem, Reported Problem, Expected Solution, Established Solution and Expected Solution. When a call is transferred to a Service Order, or when manually creating an activity, the user can go to the Probability Analysis session and update the activity, expected problem and solution with the activity, expected/established problem and solution of the record which displays a maximum probability to resolve the reported problem at hand.



Service Order Activities(tssoc2110s000) Call Tab

From Other Places

In addition, the Probability Analysis session can be started from the Diagnostic tree(when it is started from Calls session), Call Processing and from the Graphical Diagnostic Tree, when started from Calls or Call Processing.

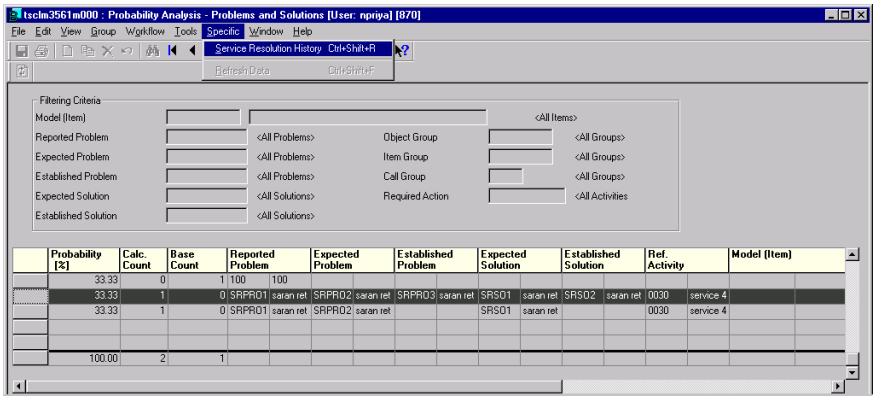
In each of the cases, the activity, expected problem, expected solution are updated in the same way from Probability Analysis, as it were updated in the Calls session.

Probability Analysis(tsclm3561m000)

In the process of registering a call the user can access Probability Analysis for the purpose of identifying a ‘most probable’ Expected Problem and a ‘most probable’ Expected Solution.

A button “Probability Analysis” is added in the Calls session (both on the form and in the specific menu), in the Diagnostic tree(when it is started from Calls session), Call Processing, Graphical Diagnostic Tree when started from Calls or Call Processing, and Service Order Activities. The session Probability Analysis (tsclm3561m000) opens.

A filter is applied to show only the resolution lines in the resolution history that are associated with the known values related to the Case at Hand. Typically the object group, item group, model (item), call group and reported problem provide the starting point for a User when entering the Probability Session. Also expected problem, expected solution, established problem, established solution and reference activity are available in the session header for further manual analysis.



Probability Analysis (tsclm3561m000)

The details in the header, like object group, item and reported problem, are defaulted from the Call/Service Order Activity and automatically the lines visualize statistical summary information from the records of problems and solutions history that match this filtering criteria.

The formula for calculation of probability is:

Probability % = (N / X) * 100 where

N = Calculated count + Base count (for a particular record)

X = Sum of Calculated count of all the records displayed + Sum of Base count of all the records displayed

When a record is double clicked, the session closes and, the fields for expected problem and solution in the Call are updated either with the Expected Problem/Solution Values or the Established Problem/Solution Values of the record selected in the Probability Analysis session. The Required Activity in the Call is also updated from the selected record.

The user can navigate to Service Resolution History, which now displays only those records which contribute to the selected probability combination line (see next paragraph.

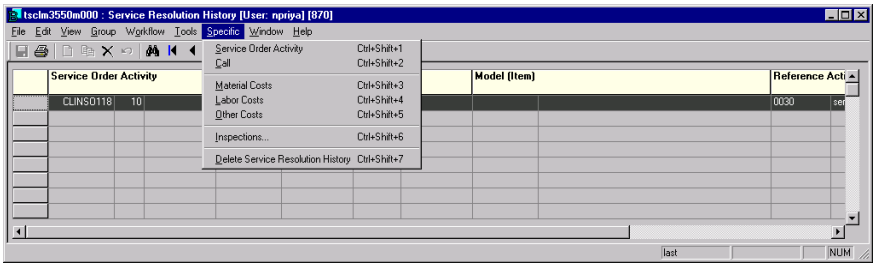
NOTE:

To modify the Filtering Criteria
If you manually change the filtering criteria, a new set of records will be displayed from the resolution history. The “New Group” button can be pressed to modify the filtering criteria.

The Object Group, Model(Item), Item Group, Call Group, Reported Problem, Expected Problem, Established Problem, Expected Solution, Established Solution and Reference Activity. Then the Refresh Filter button has to be pressed for the refreshed result set to be displayed.

Service Resolution History(tsclm3550m000)

When a call is solved or a service order activity is completed, either created from a call or manually, the resolution details are updated in this session. From here the user can mark a record, and navigate to the Originating Call or Service Order Activity. The history or the live session holding key information is made available. The user can navigate to the Costs (Which materials were used?), Activity Details (How long? And skills required?) and Inspections (What was the condition?) associated with this resolution line.

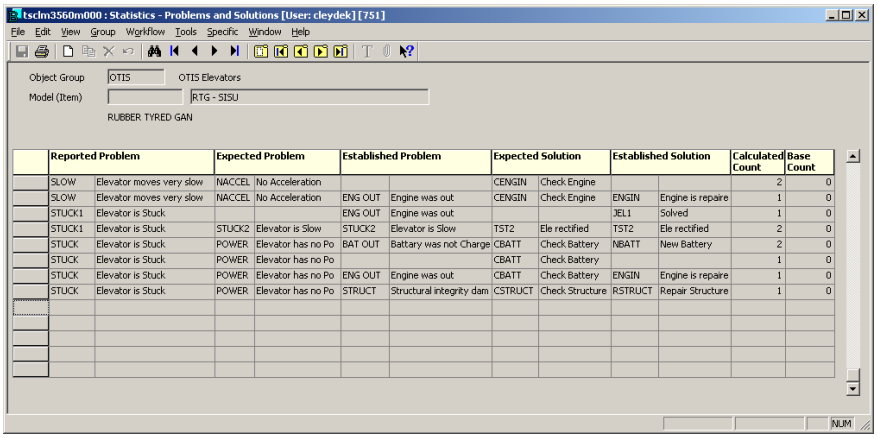


Service Resolution History(tsclm3550m000)

Statistics – Problems and Solutions(tsclm3560m000)

The user can add, view and modify the statistics of problems and solutions. When a particular combination of problems, solutions, reference activity, etc. has been identified as the one which 'best' solves a particular problem in 'most' of the times, he can increase the base count for that combination, which in turn increases its probability.

This can be started from Probability Analysis(tsclm3560m000) session when double-clicking on a line.



Statistics – Problems and Solutions(tsclm3560m000)

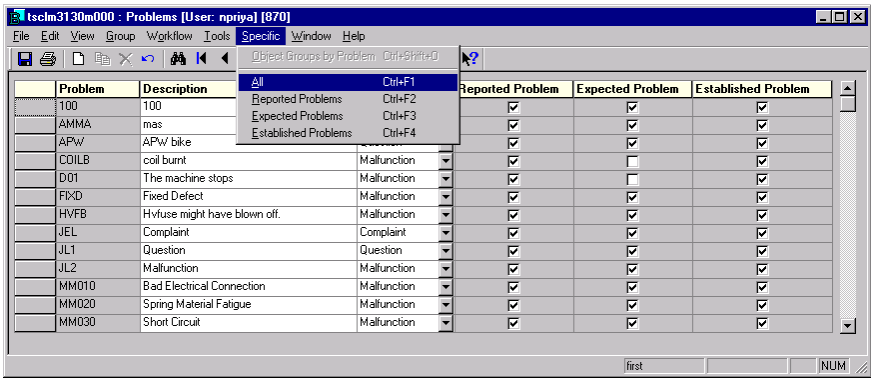
NOTE: A specific option is provided to rebuild statistics for that Object Group/Model (Item) Combination. This process deletes the existing statistics and rebuilds it based on the Service Resolution History. This means that manually added Base Counts will be reset to '0'.

Modifications in Problems(tsclm3130m000) for Advanced Reporting

A problem can be defined as an expected problem, or reported problem or an established one, or all, or some of the above. These are three new fields added as check boxes in the Problems session. When the specific option is 'Expected Problems' or when zoomed from an Expected Problem field, only the expect Problems are displayed.

When the specific option is 'Established Problems' or when zoomed from an Established Problem field, only the established problems are displayed. When the specific option is 'Reported Problems' or when zoomed from a Reported Problem field, only the reported problems are displayed. All the problems are

displayed when the session is opened, or the specific option ‘All’ is chosen after a filter.



Problems(tsclm3130m000)

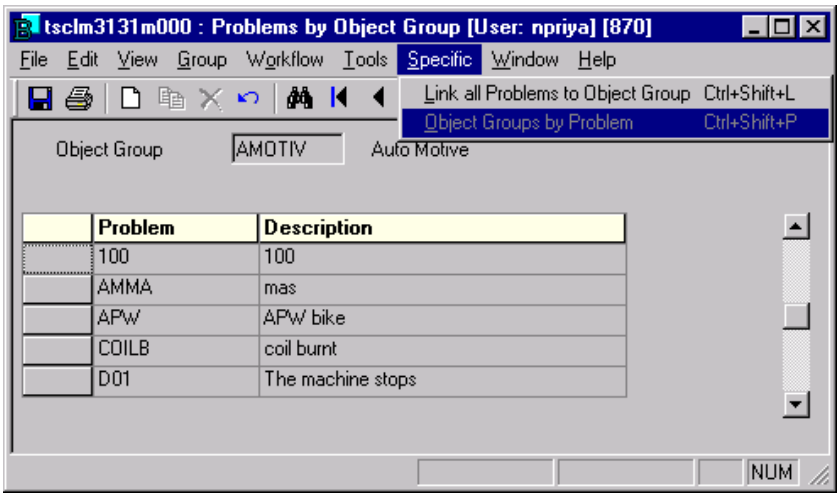
NOTE: There is a specific option to the session, Object Groups by Problems (tsclm3132m000)

Problems by Object Group(tsclm3131m000)

For a Call Agent it can be difficult to find the proper Problem and Solution Code as Problems and Solutions can be large tables. For advanced reporting the roles of problems and solution allready filter the available selection. In addition it is now possible to maintain the relation with the Object Group to help filter on the available options. For example: It is not possible report a flat tyre nor replace tyre on a computer. Only a dedicated selection of Problems and Solutions is relevant. In every Problem and Solution Field this relation can be leveraged to filter the selection when the Object Group is known.

The Problems can be linked to an Object Group using this session. This has specific options to minimize the effort for maintaining the relationship:

- Link all Problems to the selected Object Group; It can be easier to first link all Problems and then delete the ones not required.
- Navigate to the Object Groups by Problem(tsclm3132m000) Session; It can be faster to maintain the relation with Object Groups by Problem Code.

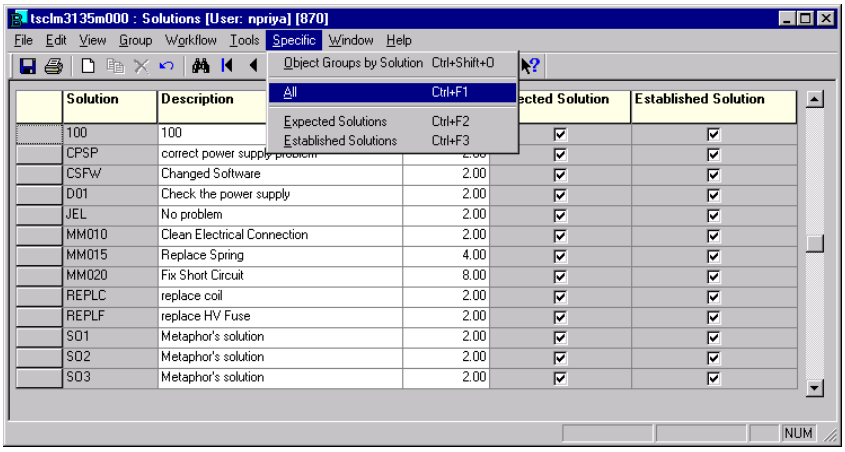


Problems by Object Group(tsclm3131m000)

Modifications in Solutions(tsclm3135m000)

A solution can be defined as an expected or an established solution. These are added as checkboxes in the session. When specific option, “Expected Solutions” is chosen or when zoomed from an Expected Solution field, only the expected solutions are displayed. Similarly, when specific option, “Established Solutions” is chosen or when zoomed from an Established Solution field, only the established solutions are displayed.

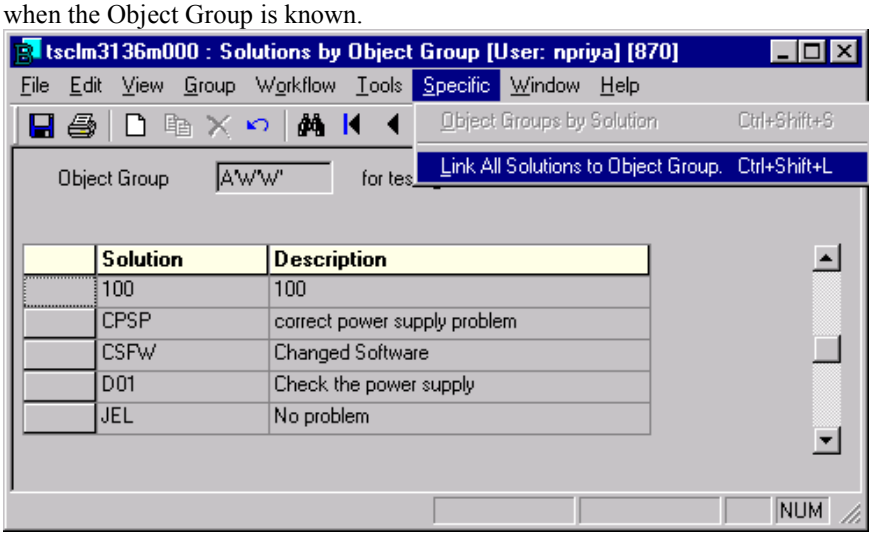
When specific option: “All” is chosen, all the Solutions are displayed. There is a specific option to the ‘Object Groups by Solution’ (tsclm3137m000) session.



Solutions (tsclm3135m000)

Solutions by Object Group(tsclm3136m000)

Similarly to Problem Codes also Solution Codes can be linked to an Object Group using this session. This in turn minimizes the search to select a Solution when the Object Group is known.



Solutions by Object Group(tsclm3136m000)

This has specific options to minimize the effort for maintaining the relationship:

- Link all Solutions to the selected Object Group; It can be easier to first link all Solutions and then delete the ones not required.
- Navigate to the Object Groups by Solution(tsclm3136m000) Session; It can be faster to maintain the relation with Object Groups by Solution Code.

Print Sessions and Reports

The following print sessions and reports are added/modified:

- The report of the session, 'Print Problems'(tsclm3430m000) also shows the fields reported problem, expected problem, and established problem.
- The report of the session, 'Print Solutions'(tsclm3435m000) also shows the fields expected solution, and established solution.
- The new session, 'Print Problems by Object Group'(tsclm3431m000) enables the user to select a range of object groups and problems and displays the problems and their description by object group.

- The new session, ‘Print Solutions by Object Group’(tsclm3436m000) enables the user to select a range of object groups and solutions and displays the solutions and their description by object group.
- The new session “Print Statistics – Problems and Solutions” (tsclm3460m000) enables the user to select the range of object groups, call groups, item groups, reported problem, expected problem, established problem, expected solution, established solution, activity and the model item, and displays the statistics of the problems and solutions.
- The new session “Print Service Resolution History”(tsclm3450m000) enables the user to select the range of object groups, call groups, item groups, reported problem, expected problem, established problem, expected solution, established solution, activity and the model item and displays the reports of the service resolution history.

Additional Features

- The menu “Application” with the menu item “Probability Analysis” is added in the graphical diagnostic tree(Only when the tree is started from the Call session).
- The user can mark a record in the Probability Analysis session and view the Service Resolution History (tsclm3550m000) associated with that particular combination of object group, model(item),reported problem, expected problem, expected solution etc. From this he can view the service order activity or call by marking a record. If the service order activity is not present in service order activities table, it is shown from the history service - order activities.

  Service Resolution History can also be opened from the Specific menu of Objects(tscfg2500m000) and Statistics – Problems and Solutions (tsclm3560m000)
- The new session, Delete Service Resolution History(tsclm3250m000) allows the user to delete a range of service resolution histories, from a specified range of service orders, activities, calls, object groups, last transaction dates and model(item)s.
- A new session ‘Conversion to Service Resolution history’(tscor0004m000) is created. This will update the Service Resolution History with the existing data present in the call history, service order activities, and history service order activities. The user can fill a range of Sold to Business Partners, Call, Call Groups, Service Orders.

Illustration

Scenario 1 (Advanced Reporting of Problems and Solutions)

Problems & Solutions are used in a dedicated way. By this we can classify the big list of problems in the problem table to either Reported Problem, Expected Problem or Established Problem. It can also be a combination of two or all. Similarly Solutions can be classified into Expected Solution or Established Solution or a combination of these two.

For example,

A customer may have the following codes in call handling.

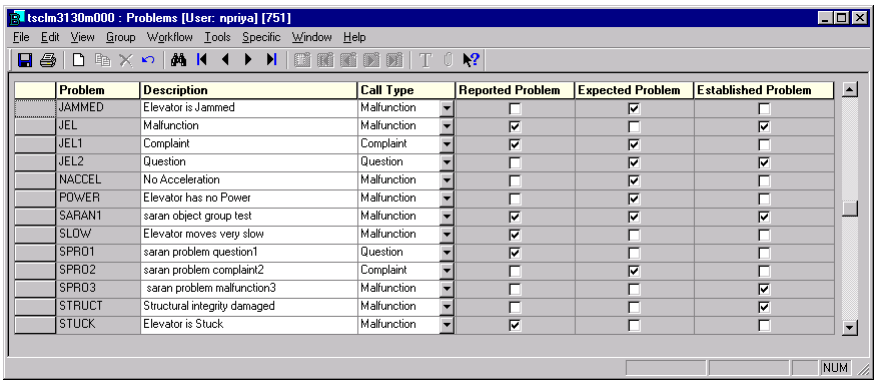
Problem, Category, Cause, Action, Condition. Each of these codes representing different meaning or state. With the help of dedication functionality we can leverage the same problems table to define Problem Codes which are only relevant as either

1. Reported Problem
2. Expected Problem
3. Established Problem

to convey different meanings by mapping

- Problem to Reported Problem,
- Category to Expected Problem
- Cause to Established Problem.

In the screen shot, some of the problems are only Reported Problems (SLOW), some are only Expected Problems (POWER) and some are only Established Problems (STRUCT), while others are a combination of the three.



With the help of dedication functionality we can leverage the same Solutions table to define Solution Codes which are only relevant as either:

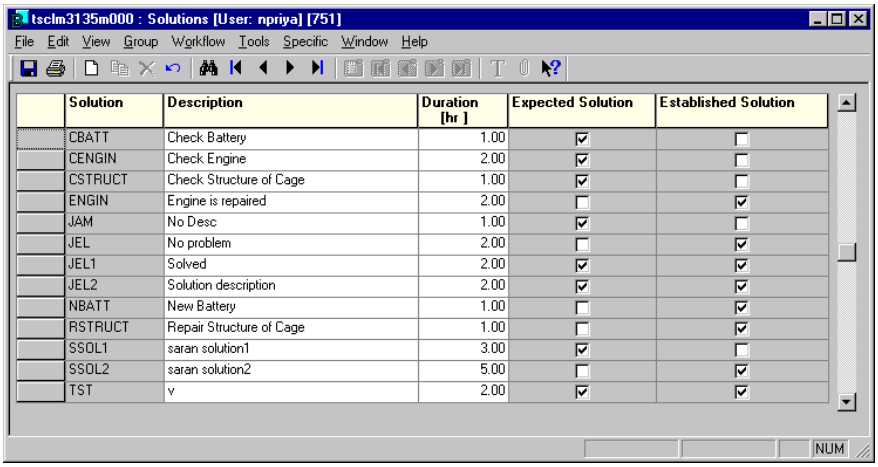
1 Expected Solution

2 Established Solution

to convey different meanings by mapping

- Action to Expected Problem
- Condition to Established Problem.

In the screenshot, some of the Solutions are only Expected Solutions(CENGIN) while some others are only Established Solutions(JEL), while others are both.



The flow of the Probability Analysis

A call is created with:

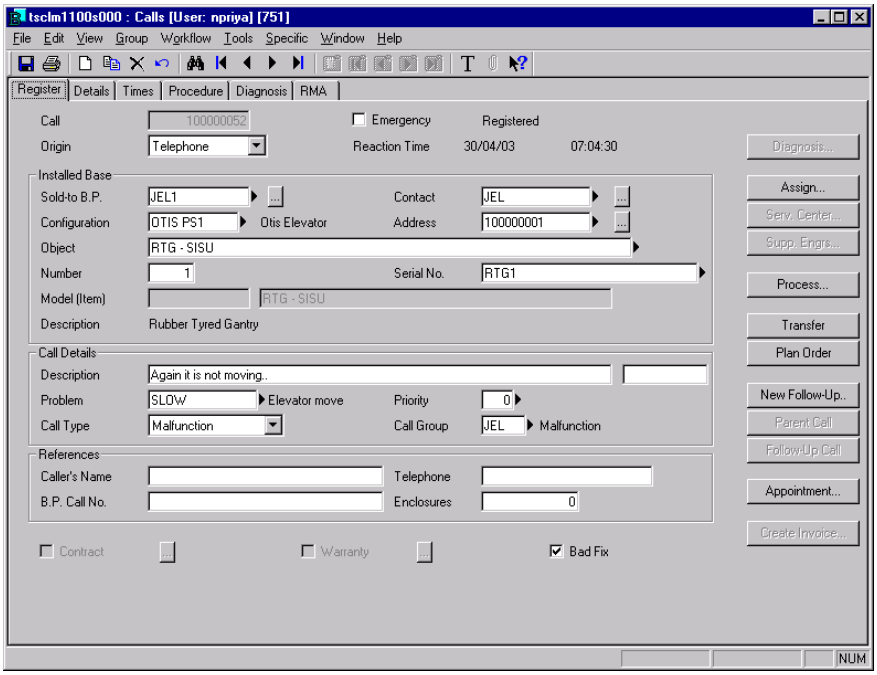
Item: RTG – SISU

Problem: SLOW (It is a Reported Problem in Problems session)

Call Group: JEL

Object Group: OTIS

Item Group: JEL



The user can goto the Graphical Diagnostic Tree for this Call. He can go to Probability Analysis from the Graphical Diagnostic Tree. The Probability Analysis session captures these values from the call:

Item: RTG – SISU

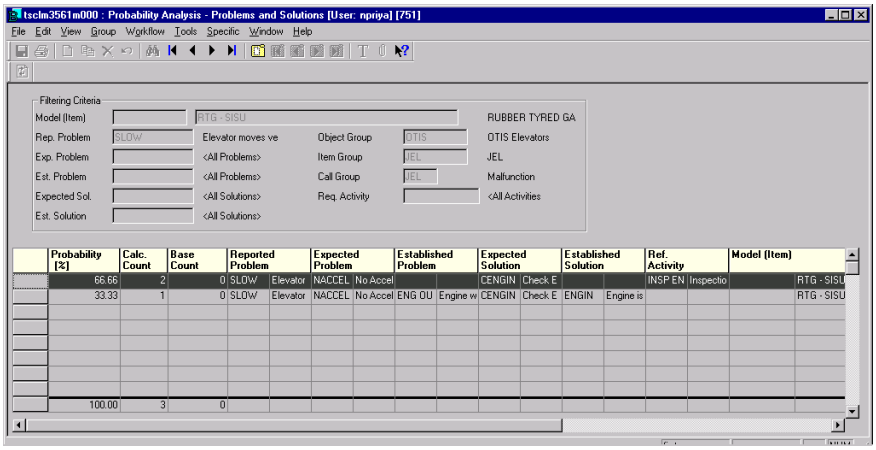
Problem: SLOW (It is a Reported Problem in Problems session)

Call Group: JEL

Object Group: OTIS

Item Group: JEL

and displays the probabilities for this combination.



Probability has been calculated like this:

Probability % = (N / X) * 100 where

N = Calculated count + Base count (for a particular record)

X = Sum of Calculated count of all the records displayed + Sum of Base count of all the records displayed

1 The highlighted record which has probability = 66%, has

Expected Problem = NACCEL ,

Expected Solution = CENGIN,

Reference Activity = INSP ENG

N = (2 + 0) = 2

X =((2+1) + (0 + 0)) = 3

Hence, P = 2/3 * 100 = 66.66%

2 The record which has probability = 33.33%, has

Expected Problem = NACCEL ,

Expected Solution = CENGIN,

Reference Activity = “”

N = (1 + 0) = 2

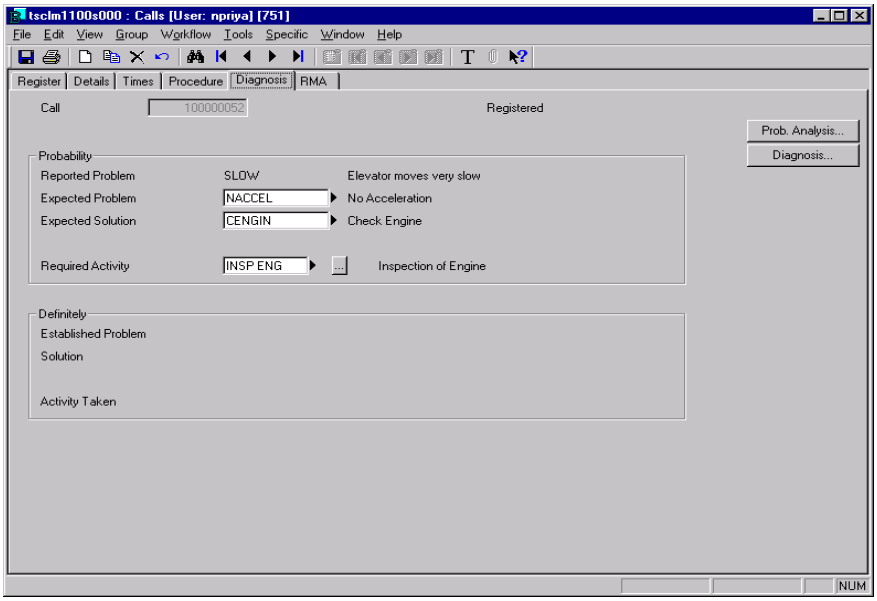
X =((2+1) + (0 + 0)) = 3

Hence, P = 1/3 * 100 = 33.33%

The user can choose to select the record that has maximum probability of solving his problem. (record 1)

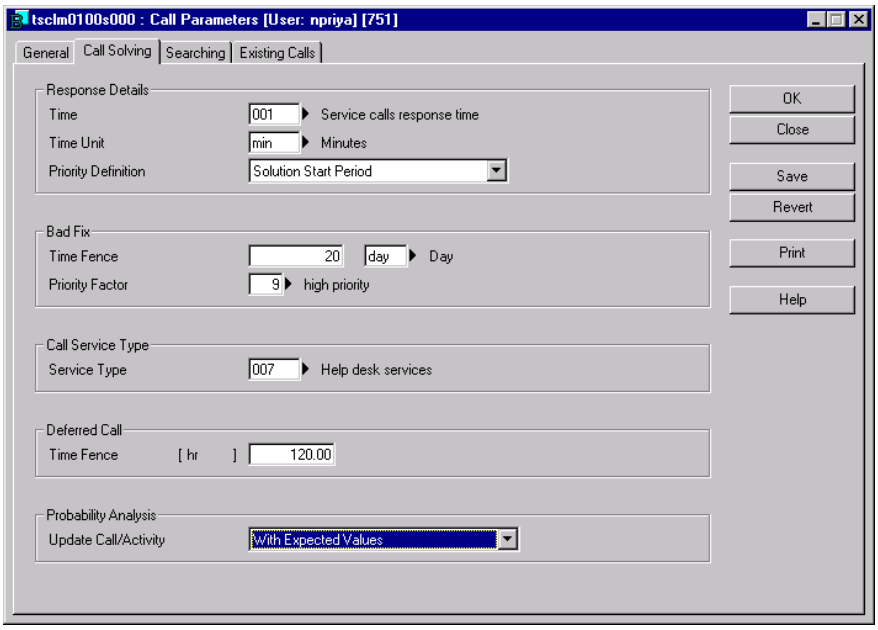
He double clicks on the record that has the maximum probability (66.66%) for solving his problem. (This has Expected Problem: NACCEL and Expected Solution: CENGIN, Reference Activity = INSP ENG)

Now, the sessions close, and the Call is updated from Probability Analysis with the Activity(INSP ENG), Expected Problem (NACCEL) and Expected Solution(CENGIN)

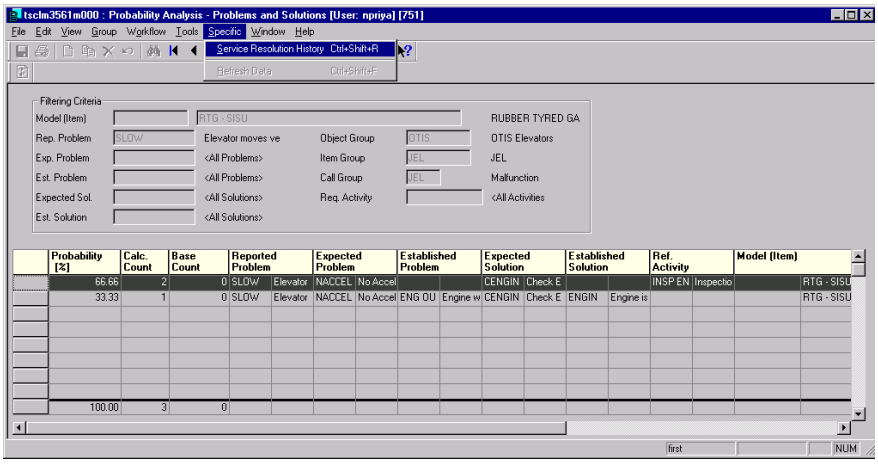


This is the end of the flow.

Advanced Reporting Call Parameter: Update Call/Activity = With Expected Values.



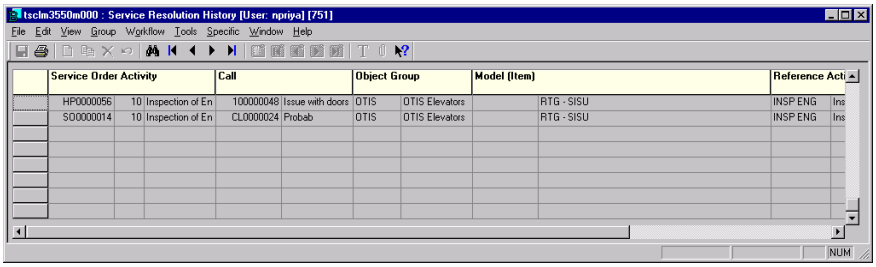
NOTE: The Service Resolution History can be started from Probability Analysis(see screenshot). This helps us understand the Calculated Count for a record.



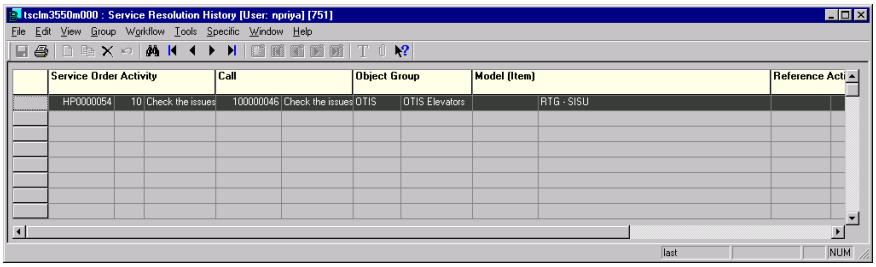
The calculated count is the count of the Call or Service Order Activity that has contributed to a particular probability. That Call or Service Order Activity contains the same combination of the Item, Reported Problem, Expected Problem, Established Problem, Expected Solution, Established Solution, Object

Group, Call Group, Item Group and Reference Activity as that of the probability record.

For the first record of Probability Analysis, the Calculated count is 2 because two calls/service order activities have contributed to this set. (See screenshot)

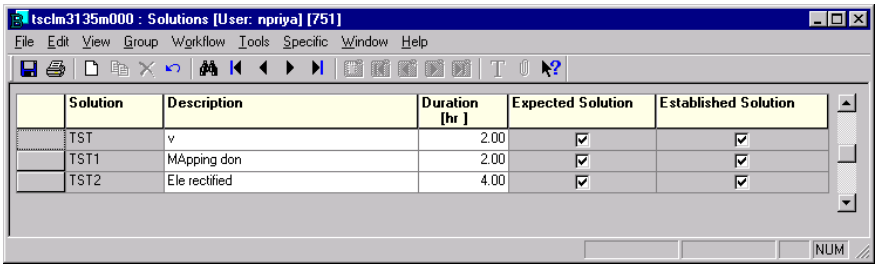


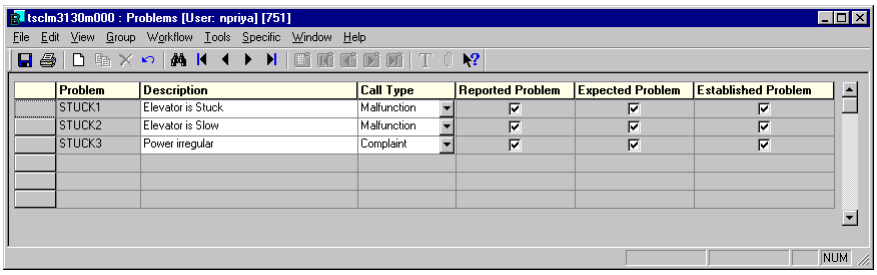
For the second record, the Calculated count is 1, because only one call/service order activity has contributed to this set. (See screenshot)



Scenario 2 (Basic Reporting of Problems and Solutions)

The Problems and Solutions are not used dedicatedly. i.e., they assume all the roles and individually describe Best AND Complete the Problem and Solution. Based on this approach the Established Values (being the last on-site recorded information) are assumed to be guidelines for future resolution diagnosis.





A call is created with:

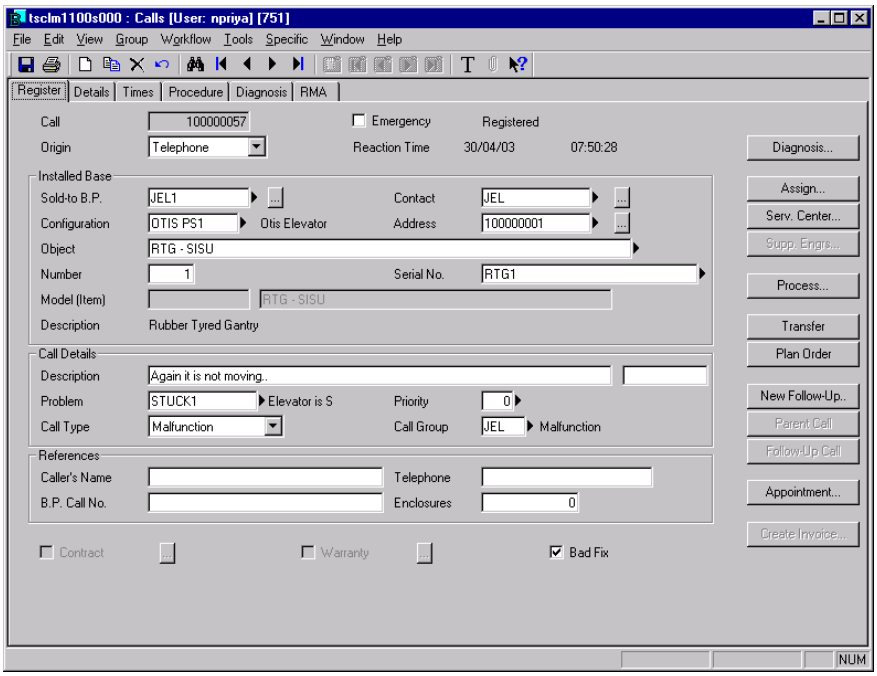
Item: RTG – SISU

Problem: STUCK1 (It has all Roles)

Call Group: JEL

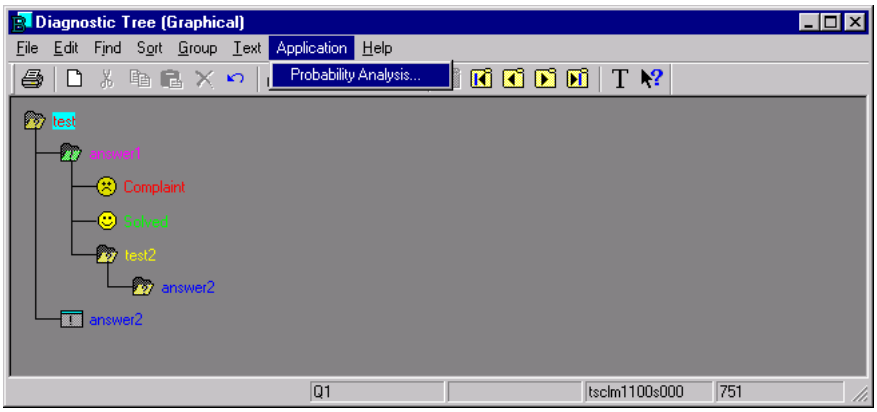
Object Group: OTIS

Item Group: JEL



The Graphical Diagnostic tree is started for the call.

The user can go to the Probability Analysis session from the Graphical Diagnostic tree.



The Probability Analysis session captures these values from the call:

Item: RTG – SISU

Problem: STUCK1 (It has all roles)

Call Group: JEL

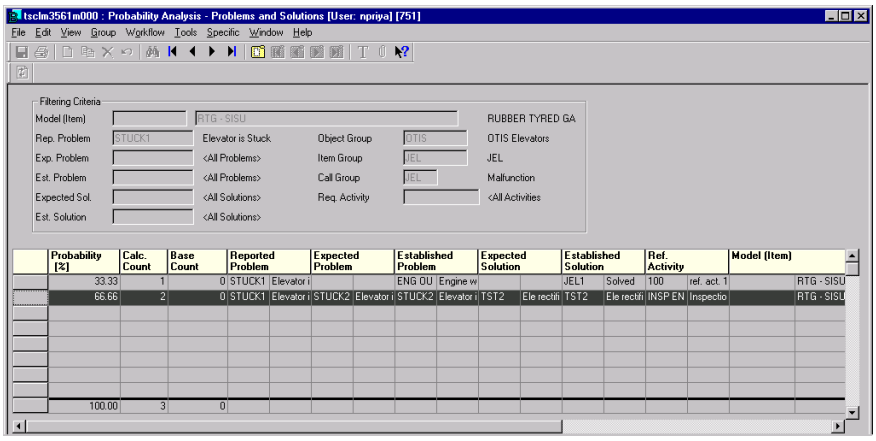
Object Group: OTIS

Item Group: JEL

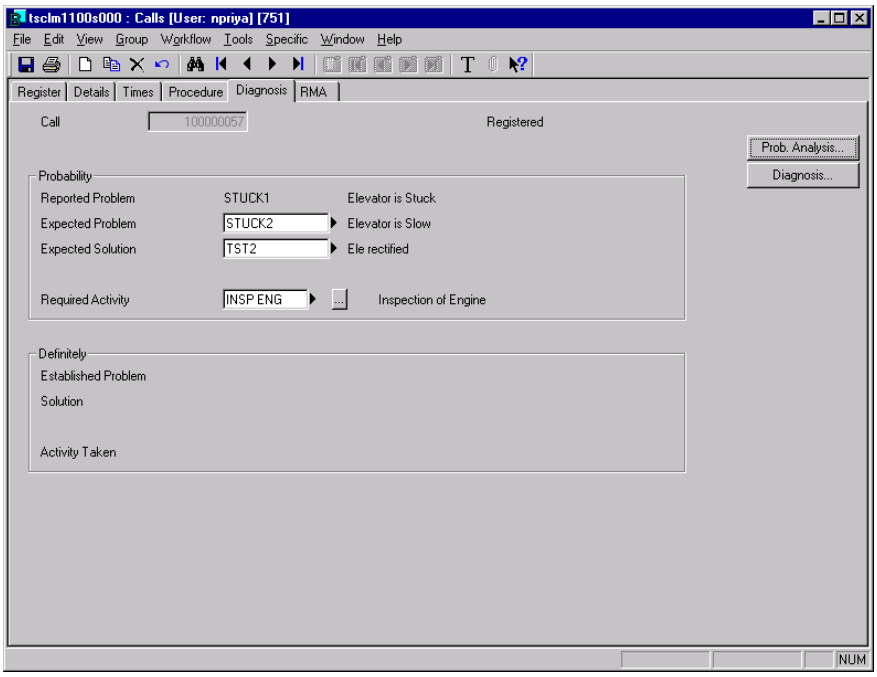
and displays the probabilities for this combination.

The Probability calculation is done in the same way as that for Scenario 1.

He chooses the solution (Established Problem: STUCK2, Established Solution: TST2, Activity: INSP ENG) which has maximum probability of solving his problem.



The Required Activity, Expected Problem and Expected Solution of the Call are updated with the Reference Activity (INSP ENG), Established Problem (STUCK2) and Established Solution (TST2) from the Probability Analysis.



Basic Reporting Call Parameter : Update Calls/ Activity = with Established Values

NOTE: This approach is used when the Problems and Solutions are not used in a dedicated way. In this setup, the Expected Problem and Expected Solution of the Call will be updated with the values of the Established Problem and Established Solution of the selecetd Probability Analysis record.