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16. Abstract <p>The Louisiana DOTD Outsourcing Decision Assistance Model was developed to assist officials of the Department of Transportation and Development (DOTD) to assess the outsourcing potential of individual activities or functions in the department. The model consists of both a qualitative and a quantitative assessment process which is conducted interactively by a user on a personal computer. The qualitative portion of the model uses the subjective judgement of one or more persons on a set number of perspectives, where each perspective is aimed at a different aspect of the potential for outsourcing. The quantitative portion of the model consists of the comparison of the cost of insourcing or outsourcing the activity. This manual describes how to install and use the computer program that executes both the qualitative and quantitative portions of the model.</p>			
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USER MANUAL FOR OUTSOURCING DECISION ASSISTANCE MODEL (ODAM)

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1. Introduction

The Louisiana DOTD Outsourcing Decision Assistance Model was developed to assist officials of the Department of Transportation and Development (DOTD) to assess the outsourcing potential of individual activities or functions in the department. The model consists of both a qualitative and a quantitative assessment process which is conducted interactively by a user on a personal computer. The qualitative portion of the model uses the subjective judgement of one or more persons on a set number of perspectives, where each perspective is aimed at a different aspect of the potential for outsourcing. The quantitative portion of the model consists of the comparison of the cost of insourcing or outsourcing the activity. This manual describes how to install and use the computer program that executes both the qualitative and quantitative portions of the model.

2. Installation instructions

1. Insert the CD program disk into the CD-ROM drive.
2. Double click on My Computer icon on the desktop.
3. Double click on the CD icon to display the files on the CD.
4. Double click on the Setup file and follow the instructions to install the program.
5. Close My Computer.

3. Initiating the program

The program is initiated by clicking on the Windows “Start” button on the lower left-hand side of the screen, moving the cursor over “Programs,” “Outsourcing System,” and “Outsourcing,” and clicking on “Outsourcing.” This will generate the title screen of the Outsourcing Program from which the rest of the program is accessed (see figure 1).

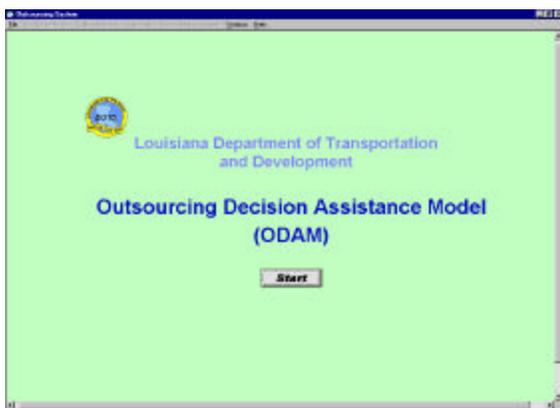


Figure 1
Title page

There are two ways to start the program:

1. In the lower center of the title screen, there is a “Start” button. Click it to proceed with the application of the program.
2. Alternatively, at the top of the title screen are Windows-style pull-down menus, and clicking on the FILE pull-down menu and then on “Start” will initiate the program.

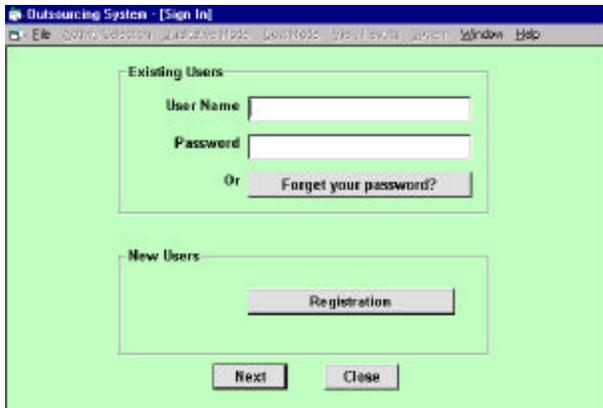


Figure 2
Sign-in

The next window to be displayed is the “Sign In” screen shown in figure 2. Users who have not registered before on the computer being used, must register by clicking the “registration” button, and then enter an unused user name, a password, and a hint for the password. The new user is asked to enter the password twice to reduce the risk of mistyping an intended password. User name and password information is entered into a database that is accessed at each sign-in.

Those who have registered before are required to enter the user name and password they established at their first sign-in. User names and passwords are not case sensitive within the program. If the password is forgotten, the “Forget your password?” button can be clicked to get the hint regarding the password submitted at the time of first registration. By clicking the “Next” button at the bottom of the screen, the user name and the password are checked and if they are found in the database, a message acknowledging success is posted on the screen. Successful sign-in grants the user access to previously submitted information. This allows a user the opportunity to review and edit any information they submitted on earlier runs. Users may review and edit their own information only.



Figure 3
Activity selection

Successful sign-in automatically carries the user name and password to the next screen, the “Activity Selection” screen shown in figure 3, by populating the user name box. In this screen, the user must identify the activity to be analyzed by either selecting from the list shown on the screen and clicking on the “Return” key, or by adding an activity using the “Add/Remove activity” button. The resulting screen for adding/removing activities is shown in figure 4.

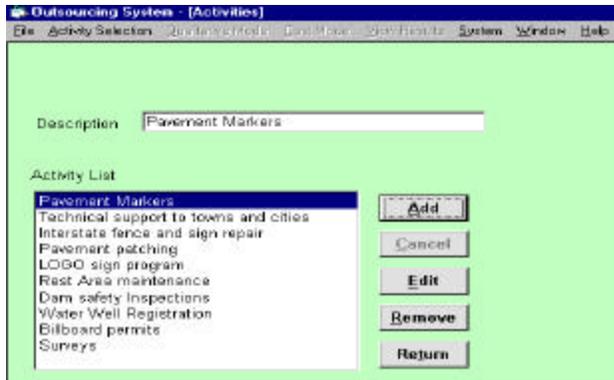


Figure 4
Adding/removing activities

To add an activity, click the “Add” button. Its caption will be changed to “OK”. An activity can then be added by entering its title in the description box. Once the title of a new activity has been typed in the description box, it is added to the list of activities by clicking on the “OK” button. The “Cancel” button is used to cancel the adding action. Clicking on “Return” button takes the user to the Activity Selection Screen.

In the “Activity Selection” screen, existing activities may be removed by clicking on the activity in the list and clicking on the “Remove” button. To edit an existing activity:

1. select the activity by clicking on it.
2. change the title in description box.
3. click the “Edit” button to confirm the change

The last matter to be addressed by a user while on the Activity Selection Screen (Figure 3) is whether the Qualitative or the Cost model is to be run first. Either model may be selected as they function totally independently. Selecting the Qualitative model leads to the screens described in the next section. Selecting the Cost model leads to the screens described in section 5.

4. Running the qualitative model

4.1 Selecting perspectives relevant to the activity under consideration. The Qualitative model evaluates the potential of an activity for outsourcing by employing the subjective assessment of the user on six independent perspectives. These perspectives describe different aspects of outsourcing that are generic to all outsourcing. The first four of these perspectives correspond to the “Balanced Scorecard” concept developed by Professor Bob Kaplan and others at Harvard University (Kaplan and Norton, 1992). The last two perspectives are particularly significant in the public sector and have been added for completeness. The six perspectives are:

1. Customer perspective:
This perspective focuses on the interests of citizens, legislators, public officials, and special interest groups, and considers compliance with laws and regulations related to the activity under consideration.
2. Internal business perspective:

The focus in this perspective is on agency core competencies, processes, technology capability, and technical expertise.

3. Innovation and control perspective:

This perspective focuses on the agency’s need to monitor and control the activity under consideration, the ability of the agency to outsource on a limited basis, and the effects on other agencies should outsourcing occur.

4. Financial (Cost) perspective:

In this perspective the focus is on cost aspects, capital investment issues, and the timeliness of the activity under consideration.

5. Employee perspective:

Focus on employee morale, retraining, and relocation.

6. Contractor market perspective:

The focus in this perspective is on the availability of qualified private sector contractors, the potential of a contractor establishing a monopoly, and the degree of prior outsourcing experience in the agency.

The six perspectives are listed in figure 5. The user must select those perspectives which are applicable in assessing the outsourcing potential of the activity under consideration. The description of each perspective, as described above, can be obtained while operating the program by placing the cursor over a perspective and clicking to produce a pop-up screen with the description of the perspective. Perspectives are selected by checking in the box opposite each perspective. To deselect

a perspective that was erroneously selected, click on the box again. At least one perspective must be selected to proceed. Clicking on the “next” button (or pressing the “return” key) will take you to the next window; clicking on the “previous” button allows you to go back to the previous window.

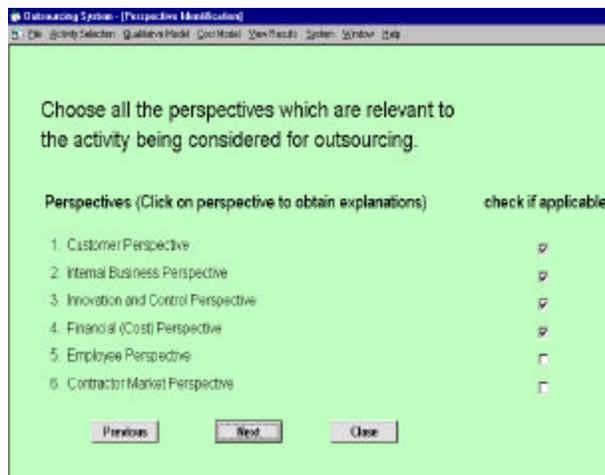


Figure 5
Identifying relevant perspectives

4.2 Weighting perspectives The relative importance of the perspectives identified in the previous window are established using a sliding scale as shown in figure 6. For each perspective that is relevant

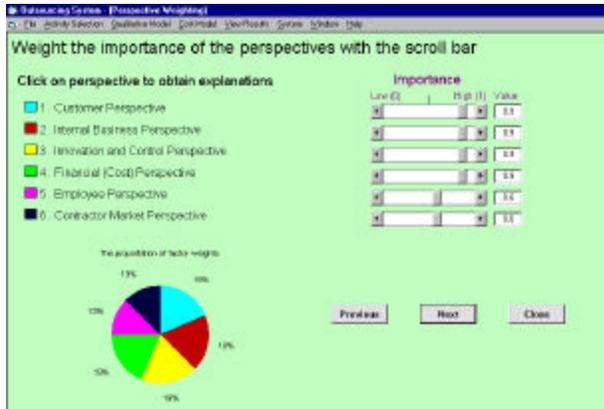


Figure 6
Weighting perspectives

Since the weights produced by this procedure are relative (i.e. assigning perspectives of equal importance will ensure equal weights for each perspective irrespective of where on the importance scale each perspective is rated), a pie-chart showing the relative importance of each perspective is shown in the bottom left-hand corner of the screen. The pie-chart allows the user to visually assess whether the relative importance of the different perspectives is correct.

4.3 Rating and weighting criteria. Within each perspective, criteria are used to measure how well suited the activity is to outsourcing by considering each facet of a perspective using a different criterion. For example, on the Customer Perspective, the extent to which an activity is suited to outsourcing is measured by the users level of agreement with the following four statements:

1. Outsourcing the activity is consistent with state laws, rules, and regulations.
2. The contract provides for the protection of the welfare and public safety of citizens in case of default by the private contractor.
3. The activity has low overall political support.
4. Citizens, users of the activity, interest groups, or public officials want the function provided in-house.

Agreement on the first three criteria above and disagreement on the fourth favors outsourcing. In the rating scale used in this program, statements favoring outsourcing generate positive scores when the user agrees with them and negative scores when the user disagrees. Similarly, statements favoring insourcing generate negative scores when a user agrees with them and positive scores when the user does not. The maximum score on a criterion, obtained by either totally disagreeing or totally agreeing with a statement, is -1 or +1 depending on whether the statement favors insourcing or outsourcing, respectively. Neither agreeing nor disagreeing is depicted by a value of zero on the agreement scale. The evaluating process

in assessing the outsourcing potential of an activity, the user is required to subjectively indicate the importance on the scales which progress from “low” on the left to “high” on the right. This is done by dragging the block in each scale to the desired position on the scale. The importance value, which ranges from zero to one, is shown in the small window to the right of the scale. Importance weights may also be assigned by entering values in the small windows.

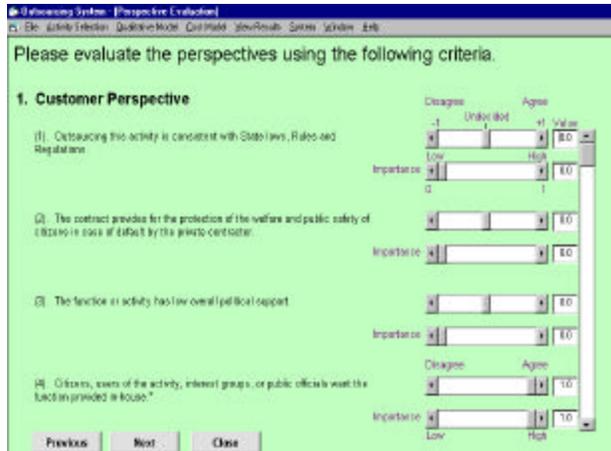


Figure 7
Rating and weighting criteria

requires the user to indicate the level of agreement or disagreement with each statement and the importance of each criterion that the statement represents. The user indicates a level of agreement with each statement by dragging the block in the sliding scale next to each criterion to the position on the scale that reflects the considered level of agreement. The level of agreement is shown in the box next to each criterion. Values between -1 and +1 may also be entered in these boxes as an alternative means of entering

agreement data. The default position on the agreement is mid-scale at zero. The criteria for the first perspective are shown in Figure 7.

The model allows criteria to attain different weights to reflect their relative importance for the activity under consideration. The weights, which range from a low of zero to a high of one, are set on the sliding scale immediately below the agreement scale. The importance weight is shown in the box next to the importance scale. Values between zero and one may also be entered in these boxes as an alternative means of entering criterion importance weights. The default position of the criterion importance weight is zero. For each perspective, at least one criterion importance weight must be larger than zero.

Activities are rated on several criteria in each perspective. Each perspective is evaluated on a separate page. After evaluation of the perspective, clicking the “Next” button will lead to the evaluation of next perspective. A message box informs the user once all selected perspectives have been evaluated.

4.4 Result of qualitative analysis. The level of agreement on each criterion rating is first multiplied by the criterion importance weight. The resulting weighted criterion ratings are then summed and divided by the sum of criterion importance weights to get a weighted average perspective rating. The weighted average perspective ratings are then converted to range between zero and one by adding one to their value and dividing by two. Each converted weighted average perspective rating is then multiplied by the weight of the perspective. These values are summed over the perspectives and divided by the sum of the perspective weights to produce a qualitative index for the activity. The index varies between 0 and 1. Low number indicates a preference for insourcing while high values indicate a preference for outsourcing. The qualitative index is mathematically described as:

$$QI = \frac{1}{\sum_{k=1}^K I_k} \left[\sum_{k=1}^K I_k \cdot \frac{1}{2} \left\{ \frac{\sum_{j=1}^J (r_{jk} \cdot w_{jk})}{\sum_{j=1}^J w_{jk}} + 1 \right\} \right] \dots \dots \dots (1)$$

where,

QI = Qualitative Index

I_k = Importance rating of the k^{th} perspective

K = Number of perspectives

r_{jk} = rating on the j^{th} criterion of the k^{th} perspective

w_{jk} = weight of the j^{th} criterion of the k^{th} perspective

J_k = Number of criteria in the k^{th} perspective

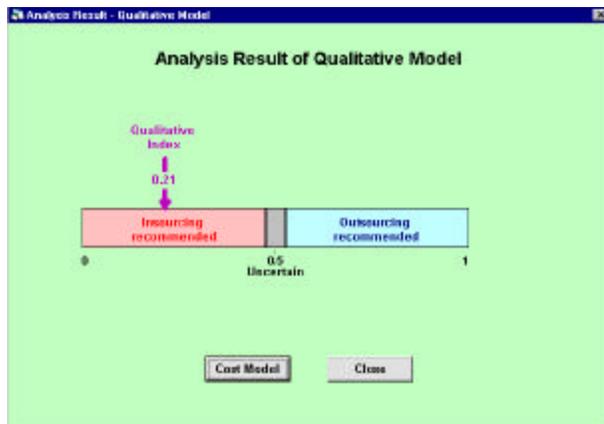


Figure 8
Result of qualitative model

The qualitative index from the qualitative analysis is shown graphically on a horizontal scale in the last window of the qualitative model. This window is shown in Figure 8. The total score is shown with an arrow marked “Qualitative Index” pointing down on the position in the scale coinciding with the score obtained. The score is also shown numerically in a break in the Qualitative Index arrow. A range of uncertainty is shown as a gray area in the middle of the Qualitative

Index scale. The default width of the gray area is 5 percent of the scale (i.e. 0.025 either side of the neutral position of 0.5) but it can be adjusted by going to the “System” pull-down menu on the title page, clicking “Constant rates” and adjusting the value in “Uncertainty Boundary” .

5. Running the cost model

5.1 Accessing the cost model. The cost model can be accessed from:

1. The last screen of the qualitative model by clicking the “Cost Model” button;
2. The Activity Selection screen and clicking the “Cost Model” button (see Figure 3);
3. The title page under the “Cost Model” pull-down menu after the successful sign-in.

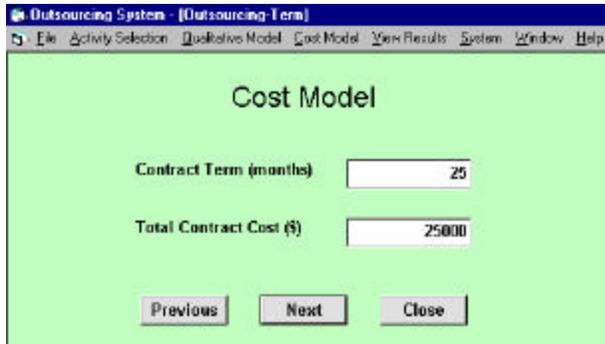


Figure 9
Cost model opening screen

Category	Annual Cost (\$)	Total Cost During 25 Months
Revenue Decreases (Reduced User Fee Collection)	00000	41667
Lost Grants or Subsidies	40000	93333
Other Contractor Costs	120	250
Subtotal	60120	125250
Credit for New Revenues	1200	2500
Total	58920	122750

Figure 10
Associated contract costs

Category	Annual Cost (\$)	Total Cost During 25 Months
Space Provided	12	25
Equipment Provided	0	0
Facility Maintenance Provided	0	0
Other Provisions	0	0
Total	12	25

Figure 11
Contract support costs

5.2 Estimating outsourcing costs. In the cost model, the first window is for entering the contract term and cost. This is shown in figure 9. The user is required to enter the contract term in months (integer or floating point) and total contract amount in dollars (integer). Once the information is entered, the user clicks on the “Next” button. This leads to a series of screens in which the user is able to enter costs associated—first, with contracting out and, secondly, with conducting the activity in-house. Each cost screen is described below.

The first screen, shown in figure 10 allows the user to enter any costs associated with lost revenue or additional revenue that results from contracting out the activity under consideration. For example, if contracting out the activity involves a loss of fees, subsidies, grants, tolls, or any other revenue, this should be recorded as a cost to outsourcing in this table. If, on the other hand, it involves additional revenue as, for example, if the contractor pays rent on facilities or equipment provided to him, or the contractor pays permit fees as part of the execution of the contract, then this revenue is entered as a “Credit for New Revenues” in the appropriate row in the table shown in figure 10. As with all tables in the cost model, a user may only enter information in the light-colored boxes; values in gray boxes are inaccessible to the user and are calculated automatically within the program. Note that annual costs are entered

into the table and total contract costs are calculated by the program. Leaving a cost box blank has the same effect as entering zero. When clicking on “Next” to proceed to the next screen, a message box will

pop up to confirm with the user that the data in the screen may be saved.

The next screen, shown in figure 11, lists the support costs associated with contracting out the activity under consideration. Items such as the cost of providing space, equipment, and facilities to the contractor are entered in this table. As in previous windows, the user may only enter data in light colored boxes. Totals are calculated automatically. The next screen is accessed by clicking on the “Next” button.

Contractor supervision and contract administration costs are entered on the next screen (figure 12). The values entered in this table involve the in-house cost to prepare and administer the contract including the ongoing supervision of the contractor work. Fractions of a Full-Time Employee (FTE) may be entered to represent partial involvement of one or more in-house employees or full-time involvement of one or more employees for a portion of the year.

FTE	GS Level	Annual Salary	Fringe Benefits	Total during 25 Months	Other Costs (Supplies, Accounting, Data Processing, etc.)
	11	23200	10433	70252	444
					12000
					25000
Total Personnel Cost				70252	Total Other Cost
					2400

Figure 12
Contract supervision and administration costs

Category	Total Cost during 25 Months
Contract Fee	25000
Additional Contract Cost	122750
Contractor Support	26
Contractor Supervision	95252
Total	243027

Figure 13
Total outsourcing costs

Other costs, such as supplies, accounting, data processing, and any other costs associated with the administration of the contract, can also be entered in this table. Totals are automatically calculated.

The total costs of outsourcing from the four previous screens are summarized in a single table in the next screen (figure 13). This total represents the total direct costs of outsourcing. The total cost of outsourcing is later compared with the total cost of insourcing the activity.

5.3 Estimating insourcing costs. The first cost item considered in estimating the cost of insourcing an activity is personnel costs. The cost is estimated by entering the number of Full Time Employees (FTEs) to conduct the activity in-house and their GS levels in the table shown in figure 14.

the beginning of the contract), its value at the end of the contract, and the number of each item in order to estimate the total cost of depreciation over the duration of the contract. As with the previous table, if a piece of equipment is shared among different activities, the proportional cost of the item must be entered.

Category	Annual Cost (\$)	Total Cost during 24 Months
Insurance	1200	2500
Materials & Supplies	3500	7292
Repairs & Maintenance	2000	4167
Telecommunications	300	625
Travel	3000	6250
Utilities & Related Expens	200	417
Other	2300	4792
Total	12500	26643

Figure 17
Other in-house costs

Current annual costs must be entered as the program translates the annual costs to total costs over the duration of the contract. If the facility or item being leased or rented is also used to perform other activities, the total cost must be divided among the activities in proportion to the degree of use.

The cost of existing equipment table is not shown. The next screen is accessed by clicking on “Next” and the user is prompted as to whether the information in the table should be saved or not.

The cost of leasing or renting any land, building, equipment, vehicle, machinery, or any other item used in conducting the activity under consideration must be entered in the next table (figure 16).

Cost Category	In-house Costs (\$)	Outsourcing Costs (\$)	i/o
Direct Costs Only	388283	243027	1.64
Total Cost (Direct + Indirect Costs)	486365	243027	1.92

Figure 18
Total cost comparison

tables of in-house costs and summarizes the information in a single table. The indirect in-house costs are automatically calculated from default values of in-house indirect costs. These default values can be accessed and edited from the “Systems” pull-down menu on the title page.

Any other direct costs associated with the activity under consideration must be entered in the table titled “other direct costs”(see figure 17). This includes insurance, materials, supplies, repairs, maintenance, telecommunications, travel, utilities, and any other direct expenses. Values must be specified in terms of annual costs.

The next screen for in-house cost estimation is a table showing “Total In-house costs” (figure 18). This table draws information from the previous

The cost comparison of insourcing versus outsourcing is shown in the last table in the cost model. The table is shown in figure 19. The ratio of insourcing to outsourcing costs are presented in the table for the situation when direct costs alone are considered, as well as when total costs (i.e. direct plus indirect

costs) are taken into account.

A normalized cost index which varies between zero and one is also calculated by comparing in-house with outsourcing total costs. That is, the total direct plus indirect costs of insourcing and outsourcing are compared in a Cost Index calculated as follows:

$$CI = \begin{cases} 0.5(I/O) & \text{when } I \leq O, \text{ and,} \\ 1 - 0.5(O/I) & \text{when } I > O \end{cases} \dots\dots\dots (2)$$

where,

CI = Cost Index

I = Total insourcing cost

O = Total outsourcing cost

Cost Index values range between zero and one. Low values of the index suggest insourcing is less

expensive while high values indicate that outsourcing is less expensive. A value in the region of 0.5 indicates uncertainty as to whether insourcing or outsourcing is cheaper.

The index value plotted on a horizontal scale can be viewed by clicking on the “View Result” button. A diagram such as that shown in figure 20 is produced in which the normalized index is marked as the “Cost Index” and its value is printed in a break in the arrow above the title.

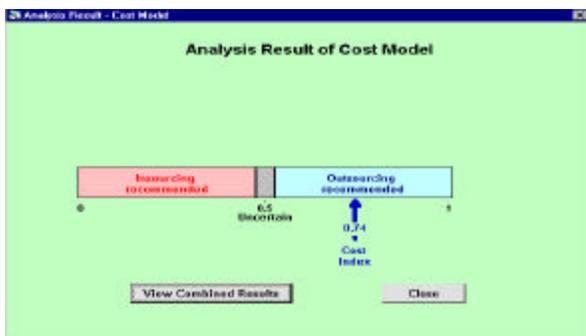


Figure 19
Result of cost model

Index” and its value is printed in a break in the arrow above the title.

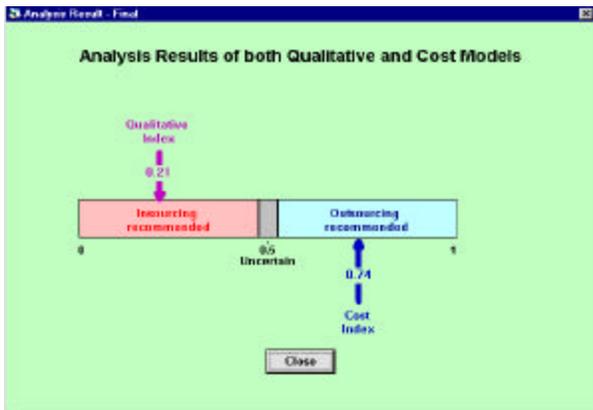


Figure 20
Final Results

6. Combined qualitative and cost results

A final result screen which combines the qualitative and quantitative analysis, as shown in figure 21, will be produced when the “View Combined Results” button on the screen showing the graphical representation of the cost model (figure 21), is clicked. As with the other scales showing the outcome of the qualitative and cost model results, the scale

runs from zero to one.

A user must interpret the results from the qualitative and cost analysis jointly. Because the index values approach the value of zero and one asymptotically, values of the indices close to zero or one indicate a strong preference for insourcing and outsourcing respectively. That is, index values at the extremes of the scale are strong indicators of preference for their respective preferences. On the other hand, when the index values are close to the middle of the scale, the choice is uncertain and the user may want to review the input or conduct a more detailed analysis before making a decision. In all cases, however, the results from the model must be considered as an aid to decision-making and not a prescription of what must be done.

7. Program maintenance

The default or standard values in the program must be updated regularly to ensure that they reflect current values. These include salary scales by GS level, overhead rate, and the additive rate for support services in the department. Default values used in the program are accessed from the “Systems” pull-down menu on the title page.

8. Use of the program in other areas

It is possible to use this program in other settings beside the Louisiana Department of Transportation and Development. It can be used in other organizations by altering the perspectives, criteria, and activities to suit the new environment. The default or standard values resident in the program will need to be adjusted to reflect conditions in the organization considered. The cost tables are fixed within the program but tables can be ignored by not entering values into them. However, cost tables cannot be added and the analyst will need to adapt existing tables to accommodate cost features that do not naturally fit into existing set of cost tables.

References:

1. Kaplan, Robert S., and Norton, David P. “The Balanced Scorecard - Measures that Drive Performance”, Product Number 4096, *Harvard Business Review*, Jan-Feb 1992.