

THE GEORGE WASHINGTON UNIVERSITY

SOFTWARE RECOMMENDATION
FOR PERKINELMER WALLAC INC.

SUBMITTED TO

DR. ERNEST FORMAN

THE SCHOOL OF BUSINESS AND PUBLIC MANAGEMENT

DECISION ANALYSIS

BY

THOMAS L. HOPKINS

ASHBURN, VA

NOVEMBER 30, 2000

TABLE OF CONTENTS

CHAPTER I: ABSTRACT	3
CHAPTER II: BACKGROUND	3
CHAPTER III: THE GOAL AND OBJECTIVES.....	5
CHAPTER IV: DECISION MAKING	5
CHAPTER V: ALTERNATIVES	7
CHAPTER VI: ANALYZING THE OBJECTIVES.....	12
CHAPTER VII: SYNTHESIZING THE ANALYSES	19
CHAPTER VIII: CONCLUSION.....	21
BIBLIOGRAPHY	24

Abstract

PerkinElmer Wallac Inc., a business unit of PerkinElmer Life Sciences, has formed a task force to recommend a new software program to be used for the business systems of the organization. The current system uses a hybrid of manual and computer processes to accomplish basic business functions creating a patchwork of stand-a-lone databases and processes. Because of the manual processes involved, valuable information cannot be efficiently summarized, analyzed and distributed to the necessary departments within the organization. The budget for the new system is \$250,000. The software assessment task force, in conjunction with management, has determined that the objectives for the new system include integration, scalability, accessibility, increased reporting capabilities, and costs must be contained within the budgeted amount.

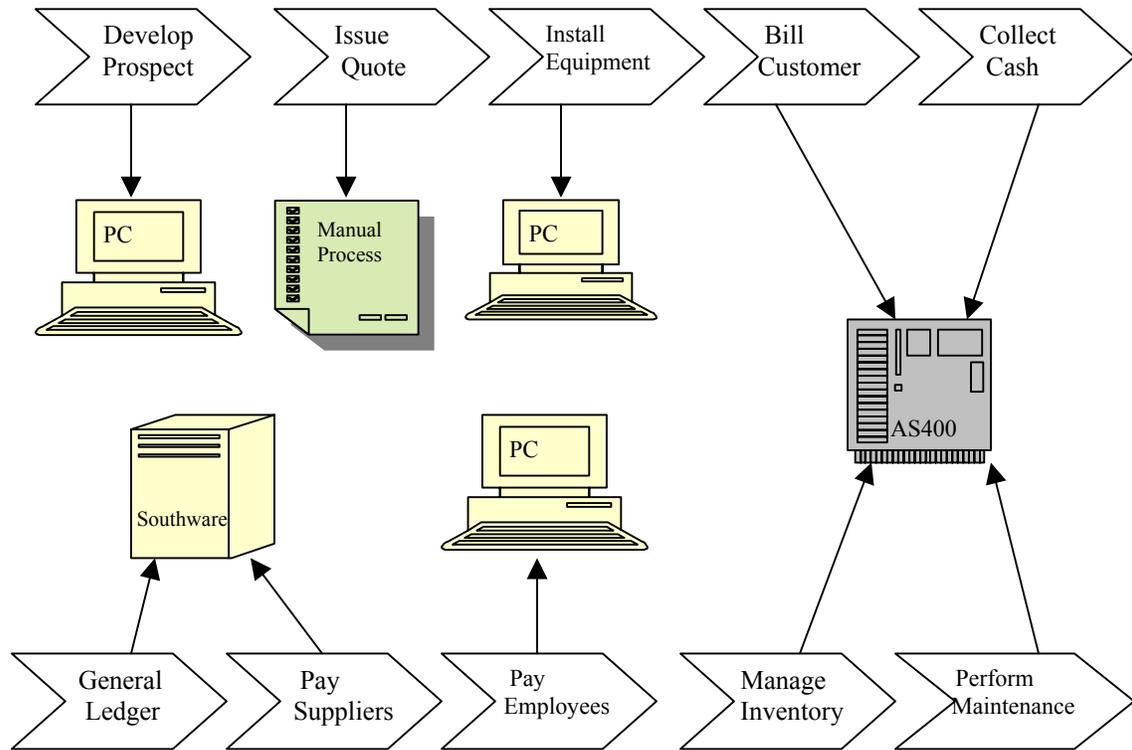
In addition, the software recommended must be user friendly and must closely match the way we do business today. That is, we do not want to embark on a business-reengineering project at the same time we are implementing the system.

The committee has already identified four software alternatives for this system. Each software package has its advantages and disadvantages as they relate to the objectives as outlined above.

As project leader for this task force, I have persuaded the committee to use Expert Choice to assist with analyzing the objectives and preferences to help us synthesize our analyses.

Chapter I: Background

PerkinElmer Wallac is the United States distribution unit of PerkinElmer (PKI) Life Sciences. Its function is to sell and market durable and consumable goods manufactured by various (PKI) Life Science manufacturers to U.S. customers, traditionally pharmaceutical and biotech companies. The unit provides technical support and field service repairs as well. In fact, the service department of PKI Wallac provides twenty five percent of its sales and twenty percent of the units' cash flow. The current flow of the business model includes issuing a quote to the buyer, receiving and recording an order, installing the items, billing the order and collecting the cash from the customer. The current business system can be diagrammed as follows:



Sales revenue as well as the number of transactions processed has increased at a rate of approximately twenty percent over the past three years. Current projections include an increase of twenty-five to thirty-five percent over the next five years.

The current system is comprised of two different computer systems plus a host of Personal Computers (PC) operating as stand-alone databases:

1. IBM System AS400 with software developed by in-house personnel provides most of the support for order entry, accounts receivable, inventory, purchasing, quoting and service administration;
2. SCO Unix system with the Southware® financial software package provides the foundation for the accounts payable, general ledger, and fixed assets modules; and
3. Multitudes of PC's with various database applications fill the void of service not provided by the other two systems. Functions such as in-house depot

repair, telemarketing, sales lead tracking, inventory forecasting, and ISO 9000 documentation are all maintained on separate stand-alone PCs.

Chapter II: The Goal and Objectives

As part of the task force to recommend a new software program platform, we have the obligation of recommending a solution that is cost effective and yields the best results for the objectives as determined by management. The following objectives will be the basis for our recommendation:

1. Purchase all software within the constraints of the financial guidelines;
2. Integrate all business processes into one complete software package;
3. Provide basis for continued growth without additional IT staff;
4. Increase accessibility of data from all personnel (field and in house);
5. Decrease ongoing software maintenance costs; and
6. Improve reporting tools to meet the reporting requirements of the unit.

Each member of the committee is responsible for analyzing the data related to this recommendation and we will use the Expert Choice software to help us synthesize the individual analyses. The committee will use Expert Choice to first prioritize the objectives and sub-objectives in relation to the goals, and then evaluate the objectives and sub-objectives as they pertain to the alternatives. We will then utilize Expert Choice as a group to make pair-wise comparisons of the alternatives as they relate to the objectives and sub-objectives.

Chapter III: Decision Making

The committee has already accomplished the first two phases of the decision-making process. The intelligence phase is primarily to gather information regarding the perceived problem and the design phase is principally used to gather information regarding designing possible alternatives.

The Intelligence Phase

The committee has identified the problems (and conversely, opportunities to pursue) with the current computer system. PerkinElmer Wallac employees that make use of the business enterprise software are considered “users” of the system. Through a series of meeting with users and other stakeholders, the committee developed a “wish list” of features desired in a new system. In addition, the group conducted a SWOT analysis to identify the problem as succinctly as possible.

<p>Strengths</p> <ul style="list-style-type: none"> • Can still offer good service support within the constraints of the IT system. • IT personnel have good “business sense” and good picture of the needs of the company. • Current system has low failure rate. 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Only one person in IT support function. • Several databases that sometimes yields conflicting information. • Cannot alter programs quick enough to match business needs. • Manual processes have started to replace automated processes.
<p>Opportunities</p> <ul style="list-style-type: none"> • Use automation to gain efficiency. • Establish one database to reduce conflicting information. • Remote access to information from outside the office. 	<p>Threats</p> <ul style="list-style-type: none"> • Business is changing faster than software can be adjusted. • Manpower needs will increase if we cannot automate the manual processes. • Behind competition in relaying information to our customers and employees. • Customers are not getting individualized service as provided by competitors. • Integrity of financial information is threatened.

The Design Phase

The wish list described earlier was used as the basis for issuing a request for proposal (RFP) from twelve different software manufacturers. All companies that responded to the RFP were asked to give a demonstration of their software's capabilities. All of the requested features were then printed on a grid and each user was asked to rate (using a range of poor to great) the packages during in-house demonstrations of the software. It was the committee members' responsibility to gather and synthesize accumulated data based on the preferences and suggest the best solution for the problem identified. After many meetings spent discussing the packages, the committee narrowed the selection pool down to four finalists. As part of the review process, the committee contacted the manufacturers' reference clients. Again, each committee member noted the impressions either verbally or through written correspondence.

Chapter IV: Alternatives

A discussion of the alternatives begins with a critique of the various software packages considered for purchasing. At least one other alternative is proposed aside from purchasing separate software packages.

ALCIE

The ALCIE (an acronym for Assets, Liabilities, Capital, Income and Expense) system manufactured by CD Data Corporation is designed to run on an Oracle database platform and is fully integrated with all modules. The service module would

require modifications. The system was designed mainly for distribution companies and was later modified to include manufacturing features. The manufacturer also allows the buyer to purchase the source code for the software, thereby enabling one to change the software as needed. Initial costs and ongoing maintenance costs are relatively low compared to the other alternatives. The technical support department is modestly staffed with one person responsible for 120 clients. The software is rated high among users for user friendliness and visual aesthetics. The visit to the client reference site was positive as the client allowed us to move freely amongst the current users. Discussions with users revealed few problems with the software.

Manage 2000

The Manage 2000 software manufactured by ROI Incorporated is designed to run on a little known database called UNIDATA. The software was designed initially for a manufacturing operation. However, the software was later modified to include programs for a distribution company. The manufacturer does not allow the user to purchase the source code of the software; instead it creates changes based on users requests for additional fees. Initial purchase price and ongoing maintenance costs are on the higher end of the alternatives. It is a totally integrated package, although the service package would require major changes in order to meet our business needs. Technical support is adequately staffed with one person per eighty clients. The software is rated high among users for user friendliness and visual aesthetics. The

client reference site was mostly positive with a few negative comments with regard to the service module.

MGFPRO

MFGPRO is made by the QAD Company and is designed to run on its own proprietary database. As its name might imply, the software was originally designed for a manufacturing company. The software company allows the buyer to purchase source code at an additional price (double the application costs). It is more cost efficient to purchase blocks of time to have the software modified by the manufacturer to fit the needs of the business. Initial purchase price is moderate compared to the other alternatives. The package is fully integrated, with all modules fully operational. Technical support is adequately staffed with approximately eighty clients per support representative. The software was rated moderate among users for user friendliness and visual aesthetics. The client visit was poor, as the client had modified the basic system extensively. In fact, the software in use did not resemble the current product at all.

FORESIGHT

The Foresight system, manufactured by Foresight Software, Inc., is designed to run on a Progress database and was fully integrated with all modules. The system is unique in that it was originally designed to be service package only. It was later modified for distribution and manufacturing customers. The manufacturer also allows the buyer to purchase the source code for the software. Initial costs and

ongoing maintenance costs are relatively high compared to the other alternatives. The technical support department is adequately staffed with one person responsible for 75 clients. The software is rated low among users for user friendliness and visual aesthetics. The client reference site visit was mostly positive. Discussions with users revealed few problems with the software other than the visually unappealing screens.

The packages listed above are not to be confused with the alternatives available to the organization. In addition to the above choices the committee could also recommend the following alternative.

Hybrid Purchase

This alternative would be to purchase separate pieces of the software and merge the packages into one complete hybrid system. In essence, purchase a part of a package deemed to be “best of breed” and then link the separate packages so that integration of all modules are complete.

Chapter V: Pros and Cons

In assessing the alternatives as they relate to the objectives, we created a list of pros and cons for each software package. The list was based on features that were considered important in order to accomplish the overall goal given the objectives. For example, the group considers the integration objective very important and therefore, any package providing integration of all needed modules would be a positive consideration.

While all the systems were within the confines of the financial constraints, some of the products were priced relatively higher than the other systems. All other things considered equal, a higher priced package would be evaluated negatively in the pros and cons analysis.

Therefore, not only were the pros and cons considered in relation to the objectives, but they were also considered in relation from one software package to another.

A discussion of the Pros and Cons of each alternative is listed below:

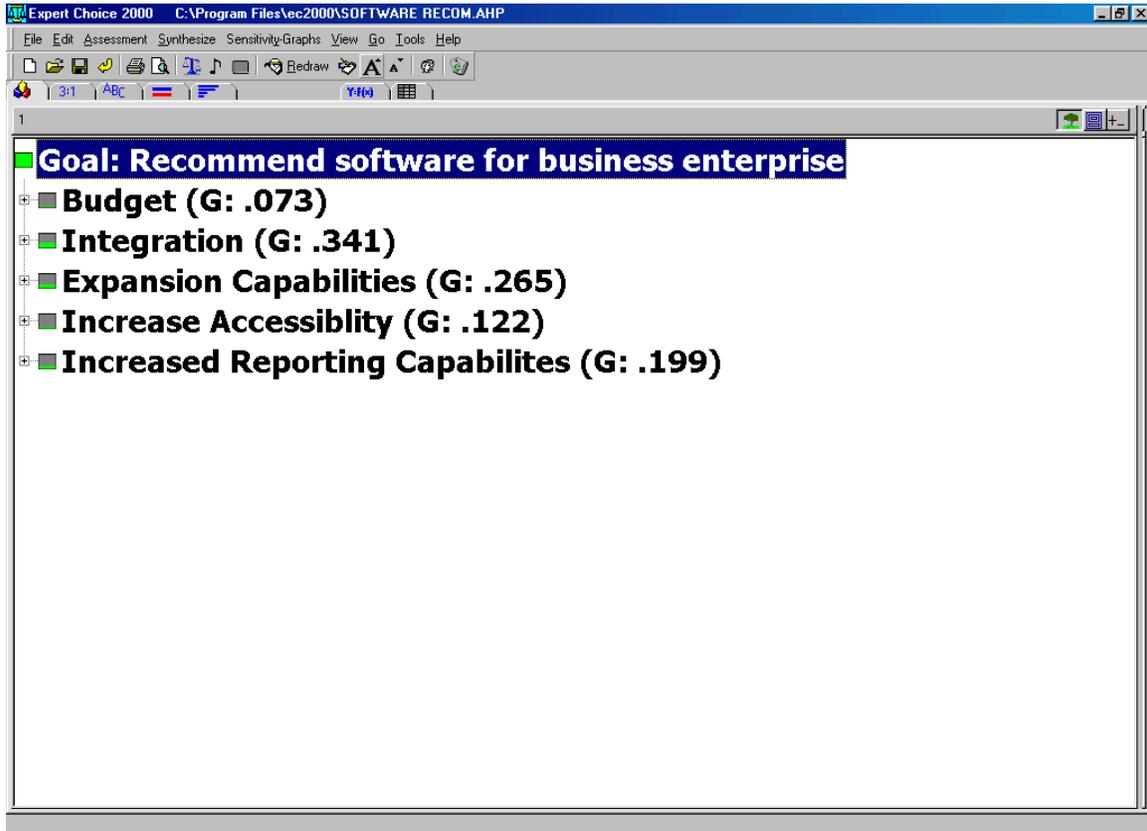
Alternative	Pros	Cons
ALCIE	<ul style="list-style-type: none"> ● Can purchase source code. ● Runs on an oracle database. ● Established customer base. ● Costs are comparatively low. ● Rated high by users for friendliness. ● Reference visit well received. 	<ul style="list-style-type: none"> ● Relatively low technical support. ● Modifications necessary for service module.
Manage 2000	<ul style="list-style-type: none"> ● Established customer base. ● Totally integrated package. ● Rated high by users for friendliness. ● Reference visit well received. ● Technical service adequate. 	<ul style="list-style-type: none"> ● Cannot purchase source code. ● Runs on little known database. ● Costs are comparatively high. ● Significant modifications necessary.
MFGPRO	<ul style="list-style-type: none"> ● Established customer base. ● Totally integrated package. ● Rated moderate by users for friendliness. ● Technical service adequate. 	<ul style="list-style-type: none"> ● Can purchase source code for an additional amount. ● Reference visit not well received. ● Runs on proprietary database.
FORESIGHT	<ul style="list-style-type: none"> ● Totally integrated package. ● Can purchase source code. ● Reference visit well received. ● Technical service adequate. 	<ul style="list-style-type: none"> ● Customer base not fully established. ● Runs on a Progress database. ● Costs are comparatively low. ● Rated low by users for friendliness.
Hybrid	<ul style="list-style-type: none"> ● Can use best of systems. ● Source code will be available. 	<ul style="list-style-type: none"> ● Will have to link the systems. ● Technical support may be difficult. ● No chance to review integrated system before implementation.

Chapter VI: Analyzing the objectives

The objectives depicted in Figure 1 were identified as necessary in order to reach a conclusion as to which software program to recommend. Figure 1 shows the top-level objectives and their relative importance to the overall goal: recommend a software package for the business enterprise.

1. Budget: The constraints on the budget are not to exceed the allocated amount of \$250,000. The ongoing maintenance costs should not exceed ten percent of the initial costs.
2. Integration. Combine the many separate databases and functions into one database.
3. Expansion Capabilities. Ensure the software can keep pace with the expected growth of the company (currently projected to be twenty five to thirty five percent over the next five years).
4. Increased Accessibility. Access to entire user community. Right now, one half of all employees are based out of the office.
5. Increased reporting capabilities. Design of the package should include reporting capability that enables users to design and print reports on an ad hoc basis.

Figure 1. Objectives as related to the overall goal.



Not surprisingly, the most important objective to the group is the integration goal (see Figure 2). The integration objective is to utilize one software application and database to maintain all records of the organization. It is not surprising that integration is the most important objective because everyone experiences the problems of having six separate software packages to manage the business. The current system yields different results for the same question depending on which database is queried. With a single database, the amount of conflicting information should be kept to a minimum as all the data are generated and stored by a single application. The Information Technology (IT) function can be more efficient as well. Instead of developing and maintaining a host of separate programs, it can write and produce on one set of programming and database

management techniques. Information about the customer can be more easily tracked from the first sales call to bill collection and service maintenance and repairs.

Perhaps the most surprising result was the high ranking of the ALCIE/FORESIGHT combination. At first glance, it seems to contradict the implicit purpose of the objective. After all, purchasing two software packages is not an integrated solution. However, the IT department made assurances that the two packages could be integrated rather easily especially since they are both written on the same database platform.

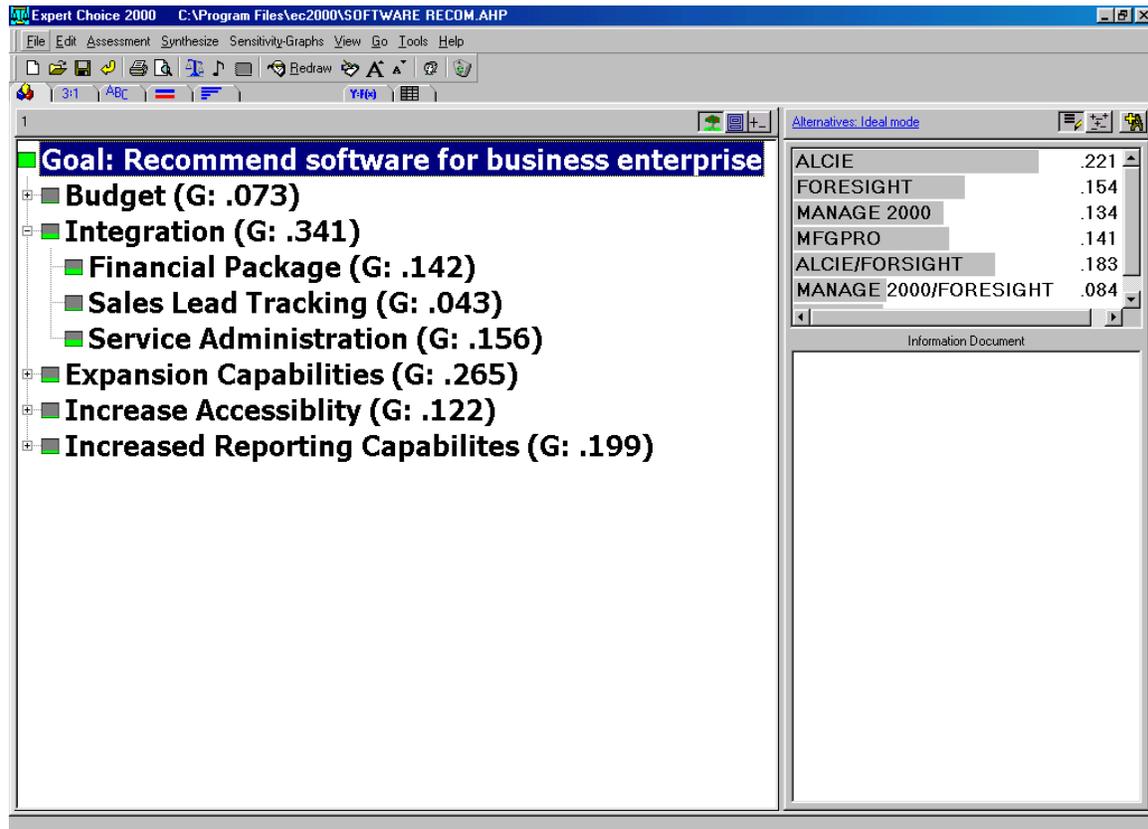
The integration objective is broken down into three sub-objectives: financial package, sales lead tracking and service administration. The financial package is the heart of any business software. It includes the record keeping function of the organization as well as the Materials Requirement Planning (MRP) function. The sales lead tracking is just as its name implies, the function of tracking potential customers and forecasting future sales. Service administration encompasses a whole host of activities related to the maintenance and repair of equipment after its placed with the customer. Such activities include dispatching a local service repairman to the highest priority call (determined by level of contract). It also includes scheduling preventative maintenance visits to ensure the instrument is calibrated and otherwise maintained. The financial package and service administration were the most important facets of the integration objective. It is more important for the service and financial package to be integrated than for the sales lead tracking. The reasoning was that the quoting module of the financial package would be a good indicator of the level of new business expected in the future.

Hence, the sales lead tracking data, while important, could be derived via the quoting module.

The ALCIE package ranked high among users for the financial package. It included many features such as the ability to drill down on a particular transaction until the source documents were reached. Once the source documents were reached, it was very easy to reprint the documents with simple keystrokes. The other packages were lacking in several features that the ALCIE system provided. The FORESIGHT package ranked high for the service administration as it most closely matched the operations method we currently employ.

The ALCIE system had the highest ranking for the sales lead tracking sub-objective. This was a result of the quoting system contained in the software. The quoting system allows users to include or exclude a potential sale in the forecast. It also allows the user to weigh the probability of getting an order and report the results based on all possibilities or by the weighted possibilities.

Figure 2: Integration with sub-objectives



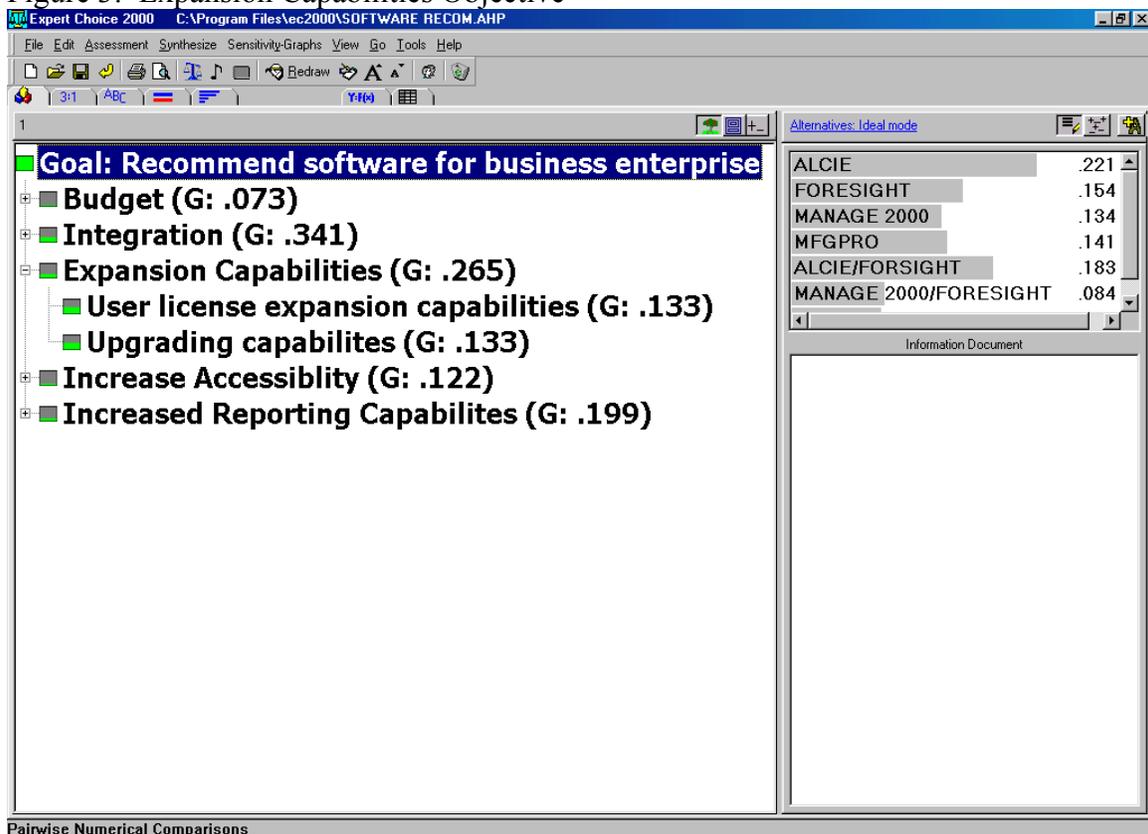
The next most important objective is the expansion capabilities (see figure 3). This requirement is a direct response to the current predicament the company faces. The problem is that growth of both transactions and personnel exceed the capacity of the system. In this case, expansion capabilities include the ability to expand the user base as well as expand the features of the system. The objective was divided equally between the sub-objectives of user expansion capabilities and upgrading capabilities.

The ALCIE package grants user licenses in forty block increments. Basically, the system allows forty concurrent users. The other packages require graduated purchases, usually in increments of ten licenses. The most expensive is the FORESIGHT software.

The least expensive is the ALCIE system. The other systems are somewhere in between these two packages.

The CD Data Corporation commits to version upgrades at least once a quarter. This means the software will be changed (bugs fixed, features enhanced) at least once a quarter. The FORESIGHT Company commits to upgrades at least twice a year, but will fix all problems (bugs) with the software immediately. The other packages do not set a timetable for new versions; rather they wait until a significant number of changes are incorporated into the product and then release a new version. There is no set definition of “significant number of changes.”

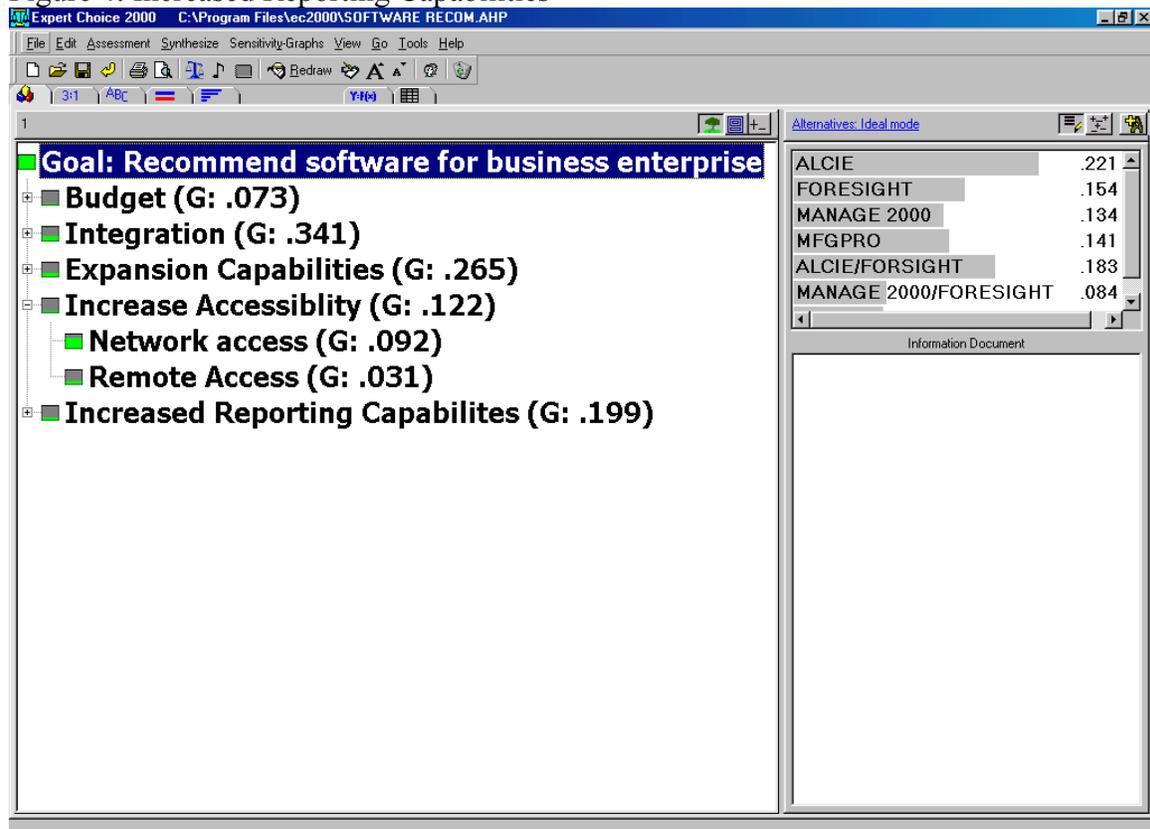
Figure 3: Expansion Capabilities Objective



The next most important objective, Increased Reporting Capabilities relates to the ability of users to obtain data from the database in a format that can be easily changed.

See figure 4. For example, the ability to get sales amounts subtotaled by salesperson, customer, product, or any other format desired. The objective is divided into two sub-objectives: single database and ease of use of report writer. The single database sub-objective relates to the issue of learning the layout of different database tables rather than one. The ease of use of report writer refers to the ability of users to manage the reports and create changes as needed on an ad hoc basis. All of the packages utilized third party packages to write impromptu reports. All of the alternatives could interface with the most popular report writing programs, including the package we are currently using. The only alternatives that did not fit were those that combined separate databases. This is because the user has to learn two separate sets of parameters, such as file and field names.

Figure 4: Increased Reporting Capabilities



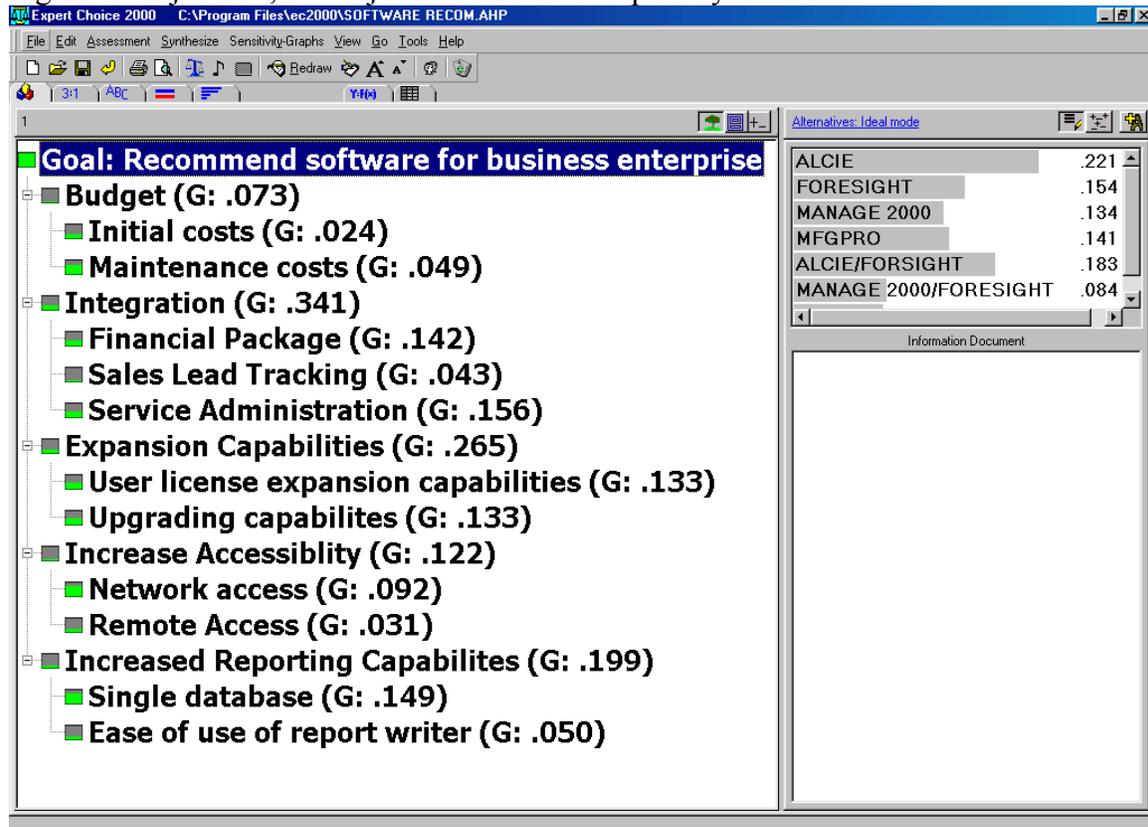
The last two objectives, Budget and Increase accessibility relate to the relative costs of the packages and the ability to access the software from remote and local connections. The budget was rated fairly low in terms of overall objectives because all of the packages fell within the budget guidelines established (\$250,000). On a relative basis the ALCIE system was the least expensive and the Manage 2000 package was the most expensive. The final negotiations are not complete, but it is assumed the prices will decrease relative to where they are today. The accessibility objective was delineated between remote and local access. All of the packages ran on standard network systems and there were no discernible differences as they relate to local connections. The main differences occurred with remote connections. The ALCIE and FORESIGHT system offer Internet capable access and both work equally well. The other packages utilize a dialup connection, which is extremely slow and requires additional phone lines.

Chapter VI: Synthesizing the Analyses

Using the verbal pairwise comparison, the task force developed the relative importance of the five objectives as they related to the overall goal of recommending business software. Each of the objectives was compared and evaluated as to importance in relation to the overall goal. For example, the budget objective when compared to the other objectives is not perceived to have a high relative importance because all of the software packages fall within the budget guidelines. The dominant objective as determined by the group is the integration objective. The integration objective is five times greater than the lowest objective, the budget objective. The group decided this objective was the most important when considering the purchase of new software because

it is the singular issue that is causing severe strains in the infrastructure of the organization (i.e., people and processes). Figure 5 details the relative precedence of each objective and sub-objective in relation to the overall goal.

Figure 5: Objectives, sub objectives and relative priority.



The task force assessed the alternatives against the objectives and sub-objectives, by reviewing the relative merits of each alternative against each sub-objective using the verbal pairwise comparison. This involved considerable discussion since different departments voiced a variety of opinions about the relative comparisons. In several areas, there was a clear choice. The difficulty became in measuring how much better or worse an alternative was compared to the other alternatives against each sub-objective.

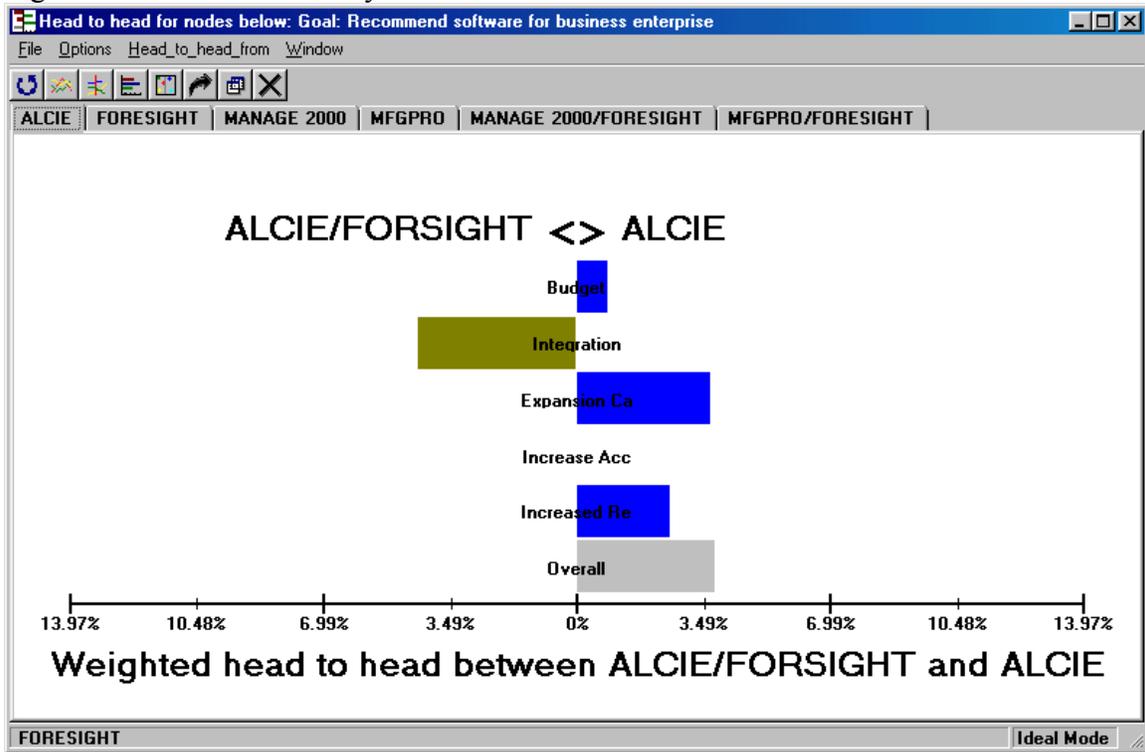
For example, the ALCIE system rated well within most of the sub-objectives. It rated very high with regard to the financial package sub objective and sales lead tracking, yet rated very low compared to the service administration sub-objective. The FORESIGHT system rated very well compare to the others in the service administration, yet was weak in other areas including financial package and lead tracking. Overall, in the integration category, the combined ALCIE/FORESIGHT alternative ranked highest among all of the alternatives. This is a result of marrying the two strongest features of each package to yield a more complete package.

The ALCIE/FORESIGHT package ranked low in three other objectives: budget, expansion capabilities, and increased reporting capabilities. This is a result of the additional costs and complexities involved with managing two separate packages rather than a single one. The other alternative combinations, such as Manage 2000/FORESIGHT did not fare well in any of the objectives because they are not ranked high as a stand-a-lone package. Therefore, combining them with another package doesn't necessarily improve the results.

Chapter VII: Conclusion

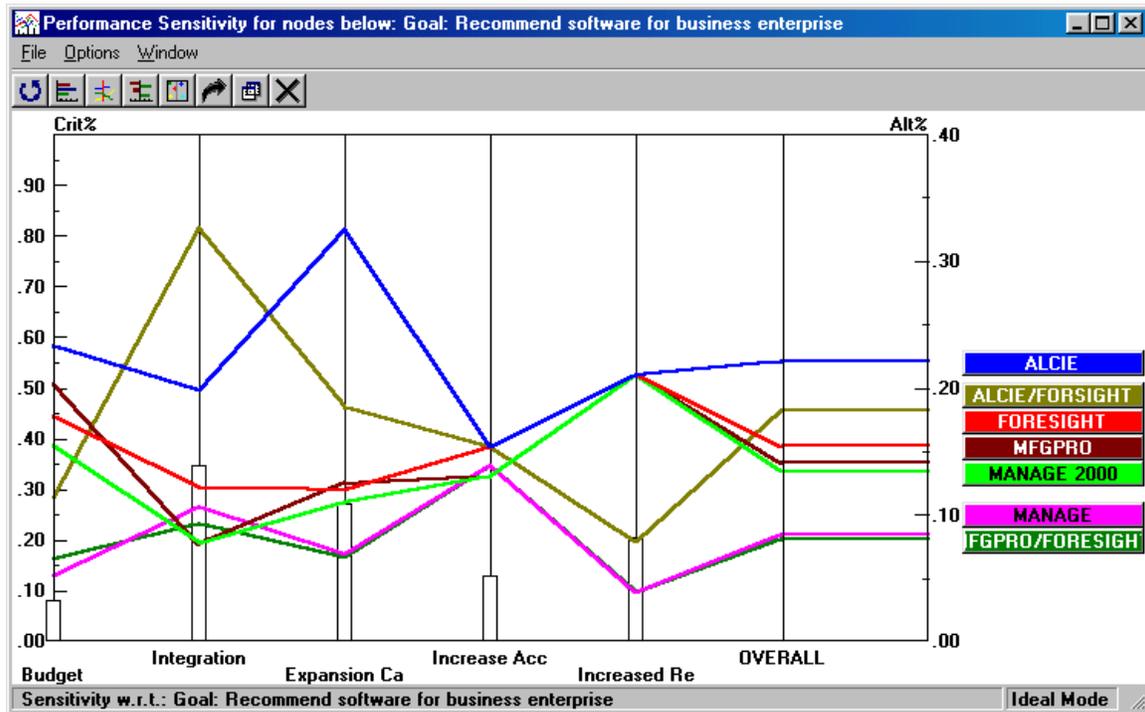
Ultimately, of the seven alternatives considered, the ALCIE package and the ALCIE/FORESIGHT combination ranked the highest. A head to head analysis (see figure 6) between ALCIE and the ALCIE/FORESIGHT indicates the strongest inclination towards the integration objective. This is because the integration objective is related to how well the different alternatives could support the three sub-objectives with out regard to costs or time needed to integrate the two packages.

Figure 6: Head to head analysis of ALCIE vs. ALCIE/FORESIGHT alternatives.



Further, reviewing a sensitivity analysis of the model (see Figure 7) indicates the ALCIE alternative ranks highest among all the alternatives for all objectives with the exception of the integration objective. As discussed previously, the ALCIE/FORESIGHT combination is the best alternative in terms of pure features of the software packages. Overall, it appears the ALCIE package is the alternative most closely matching the objectives of the task force as they relate to the goal of recommending software for the business.

Figure 7: Sensitivity analysis of Alternatives



The management of PKI WALLAC INC will make the ultimate decision with regard to our recommendation. With the model developed by the Expert Choice software, we can present our recommendations and provide a description of the process we used to develop our recommendations. The Expert Choice software created a workable forum for the group to develop and synthesize their thoughts instead of using the BOGSAT (**B**unch of **O**ld **G**uys/**G**als **S**itting **A**round **T**alking) method.

BIBLIOGRAPHY

Forman, Ernest and Mary Ann Selly. Decision by Objectives: (How to convince others that you are right), manuscript, Fall 2000.