

Litton Systems Canada (LSC): Feasibility Study

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Table of Contents	
Introduction	1
Current System	1
Problems	2
Criteria Specification and Imposed Constraints	3
Proposed Alternatives	4
Analysis of Alternatives	5
Cost-Benefit Analysis	7
The Best Alternative	7
Recommendations	7
Conclusions	8
Appendix A: Criteria Comparison Justification	9
Appendix B: Feasibility Analysis Chart	10
Appendix C: Detailed Calculations	11

Introduction

Background of Company

For our study, we chose to analyse practices within Litton Systems Canada (LSC), a military and aerospace electronics company. Their operations encompass all engineering aspects from design to in-house production to service and support. It is a mid-sized company, consisting of three Canadian facilities, (Toronto, Ottawa, and Halifax) with approximately 700 employees at the Toronto plant. Our decision to select a problem from this company stemmed partly from easy access to information, as one of our group members is currently an employee. In our endeavours to search out a non-efficient system, we came upon numerous possibilities:

- Unmonitored Internet Usage: Upper management is demanding justification for a request to purchase increased bandwidth. Currently, Internet access is given to all employees in an uncapped, unmonitored form. Lost company time and resources result from extraneous and likely non-business related bandwidth utilisation.
- Enterprise Resource Planning (ERP) Requirement: There is a need for some sort of departmental information consolidation, most effectively delivered by a partial or entire ERP system. Currently there are countless custom databases and proprietary programs on which the company's daily practices rely on. Since the scope and implications of this proposal were so large, we were placing our emphasis on implementing a partial ERP solution for the finance department only.
- Contact Management Practices: Since LSC is primarily a contract company, organization within its bidding and proposal groups is vital. Currently there is no shared vehicle to deliver potential client information between the different subgroups, therefore resulting in bad communication and a substantial amount of missed opportunities.

Of the above, our group decided that the third system, contact managing, would be the most reasonable and interesting analysis to do given the scope and purpose of this course. Interviews were conducted at three separate incidents, with Michael Mason (Director of IS), Louis Veermeersh (Project Manager of Contracts Dept), and Richard Ackerman (V.P. Finance) to extract enough information to form the basis of this report.

Current System

When a LSC employee goes away on a business excursion, it is expected that on their return, a trip report will be filed containing all the necessary information on the purpose of the trip, the events that occurred at the site, and the follow up actions required (if anything). Depending on the time available and the inclination of the individual, this may or may not happen after each trip. The most common occurrence on a business trip is the compulsory exchange of business cards. If the trip report gets produced, it may contain references to the individuals contacted and it may contain copies of all the business cards collected while away. If the report is not produced, access to these contacts is effectively non-existent for other members of the LSC group. In either case, there is no designated location or organisational procedure to handle the collective information generated by different people at different times. The business cards and even the trip reports often get misplaced or cannot be accessed by authorised users at will due to one reason or another. If, for instance, a different employee of LSC is called upon to meet with a potential client in a secondary or tertiary meeting setting, that employee has no reliable record of what has been decided from previous encounters. Word of mouth and memory work is the basic and only form of passing along information from one employee to another. Maintenance work required to keep clients satisfied and LSC employees on the ball is not done, different prospects are lost due to disorganisation and effective planning cannot be done due to lack of statistics and detailed information. This forms an all in all a fairly inefficient and haphazard way of tracking/controlling business development activities.

Problems

For a convenient and holistic overview of the situation, we have adopted the PIECES framework to assess the current system.

Performance – Does the current mode of operation provide adequate throughput and response time?

No, it does not. Appointments are routinely missed, deadlines forgone, response time is indefinite if contact info is lost or cannot be retrieved. It is estimated that only 20% of all trip reports are ever created. Of those, only 10% are ever referred to or relied upon by others.

Information – Does the current mode provide end users and managers with timely, pertinent, accurate and usefully formatted information?

No, it does not. Since there is no common consolidated information, each LSC representative keeps his/her own records of clients and contacts. This secluded method of organising data is non-conductive to planning and opportunity maximisation. Accuracy of information is also in doubt, as fragmented memories and conversation pieces are used to make critical decisions. There is no trust or confidence of integrity in the current system.

Economy – Does the current mode of operation provide cost-effective information services to the business?

Could there be a reduction in costs and/or an increase in benefits?

No, it is not cost-effective. Wasted company time costs arise from miscommunication between co-workers, re-research, and disorganised and stray data. On many occasions, the data that IS available is so sketchy that major backtracking and repeat of investigations must be conducted.

Control – Does the current mode of operation offer effective controls to protect against fraud and to guarantee accuracy and security of data and information?

Yes, it does. Fraud is a non-issue with this system, the people involved are a select authorised few who are part of the management team. Security is also acceptable, as there usually IS NO record of occurrences on excursions. Security, although not a concern as of the current system, will become one if we are to automate/computerise the procedure. These business trips and contacts are routinely business and competition sensitive and must be treated accordingly.

Efficiency – Does the current mode of operation make maximum use of available resources, including people, time, flow of forms?

No, it does not. Resources are wasted regularly, mostly in the form of manpower. Repetition of work and inaccuracy of information are the main culprits. As there is no common structure to the data available, so no procedure can be created to access them. This leads to extreme inefficiency and no proven system to follow to guarantee desirable results.

Services – Does the current mode of operation provide reliable service?

No, it does not. If the originating LSC employee in charge of the project is sick or not available, the contacts and proposal status are inaccessible as well. This creates a single point of failure for any one contract, with no backup plan.

Derived from faults highlighted by the above process and our own observations, there are four major problems obstructing the ability to do work with this system.

- a) There is, to start, **no set procedure to log or detail any of the information gathered.** (Business cards, status reports, client info, etc.) This creates a non-standard mix of reports that do not contain the same information, making tracking and statistical work impossible. Case files are incomplete, searching for data is difficult when there is no specified location to search in. The lack of an overall information input procedure encourages accidental omitting of information and reports are not written to equal thoroughness.
- b) For the material that is in existence, **there is no common way for authorised users to access any relevant information on demand.** Papers kept in desk drawers, memories that

are known only to those who remember it, contact information strewn within ones office and personal files, all contribute to an impossibly confused system of broken links with no hope of organized retrieval without the help of the collector of the data. This is unacceptable and a process must be finalised and disseminated to all users of the system to establish a working norm.

- c) **The validity of information collected is often in question.** Lack of motivation or requirement to precisely record all that occurs at a meeting results in errors and ambiguity. The lack of confidence in the value and effectiveness of the current system leads those involved in maintaining it to view record keeping as a mere task. Happenings as well as thoughts of the LSC representative must be noted as they occur and without error. The users in the current system do not trust the validity of their own accounts, thus will definitely not trust the correctness of others.
- d) Lastly, the affected group in question is approximately 15-20 people in size, all with extremely busy and varied schedules. **There is inadequate planning and a lack of effective scheduling implemented to keep all involved parties of LSC informed.** Developments in any project occur at blinding speed, and it is an extreme disadvantage to not be up to date. The current system has no way of passing important data to people who need to know within the time frame that they need to know, and in consequence LSC has lost numerous important contracts to more organized competitors.

These problems all contribute to a lack of organization on the contracts committees, resulting in a bottom line of lost projects and bids. Contracts range typically anywhere from \$450K to \$2M on average.

Criteria Specification and Imposed Constraints

As with all projects, the best solution may not be feasible for all companies. The system to be created must meet numerous requirements.

- a) **Developmental Costs** - The costs associated with designing and implementing the solution must be minimal. Management does not have a significant budget to manipulate and cannot justify high IT costs after spending a significant amount in the last fiscal year.
- b) **Implementation Time** - The requirement for this solution must be met before the beginning of LSC's next fiscal year. (July 2001) Important contracts are being negotiated and it is imperative that this new system be tested and properly in place by that time.
- c) **Interface/Usability** - The proposed solution must have a standard interface from which information can be readily added or queried by authorised users. The information referred to is all contact data, some sort of a trip reporter, all fully searchable. This interface must function in the current system environment (NT 4.0 Workstation, Novell 5.0 Server) and mesh with standard user applications. (MS Office 97, Novell GroupWise)
- d) **Data Accuracy** – The new system must be capable of achieving a high accuracy rate. Reliability must be maintained from the recording of data to the storage and maintenance of it.
- e) **Scheduling Capabilities** - The solution must have some scheduling capabilities. The ability to remind certain users of important meetings, a flight schedule of who is going where and when. Organisational procedures will stem from this portion of the system.
- f) **Training** - The solution must be user-friendly in operation, a maximum time of one week per user has been allocated for training.
- g) **Security** - Security must be appropriately controlled, all data is strictly business confidential. Only authorised users will be allowed into the system.
- h) **Maintenance costs** should be minimal, the proposed solution must be modular in design, with full documentation on usage and troubleshooting details.

Proposed Alternatives

As a collaborative group, we have decided upon three possible but different routes to achieve our goal. Each has its pros and cons, summarised below.

- a) **Web-based Custom Application** – A real-time updating custom database, this solution would be accessible anywhere there is a PC and an Internet connection. An employee would go on a business trip, take notes/collect contact information during the meeting, and input this data immediately after exiting the conference through a nearby Net-connected computer. The data (encrypted) would be transferred to the internal database within LSC, where it would be accessible to any other authorised users. Scheduler functions are handled by another custom-made package, also accessible from the same web-enabled interface as the contact manager/trip reporter. This choice would give LSC the best results in terms of customisation, matching the functions of the program with the exact requirements of the users. Problems with the software could be immediately addressed, training provided by internal staff. Developing and testing the entire suite, however, could become costly and time consuming.
- b) **Custom Database using a Palm as an interface** – While still requiring a new database system to be created, this solution would not be accessible from the web, avoiding complications with unauthorised access and other security-related issues. The time from the business trip to the time of the employee's arrival back at LSC is negligible, the data is not time sensitive as such that instant input is required. A number of Palms would be supplied in rotation for those out on trips, used for recording information within the actual meetings. The palms would be synchronised with the custom database on the network upon return, into the custom application that is linked to a third party scheduler. (MS Outlook, Novel GroupWise, etc) A Palm application will be created to interface the PDA to work with the current software set-up at LSC (scheduler). There will be a customized user interface available on the LSC Intranet to access the database. This database will generate and pass information onto the scheduler, which will act accordingly. This solution will not be as expensive as the first, as large portions of the developmental costs are off-loaded by using a third party scheduler. The usage of such programs, however, induces patchwork programming to mesh the custom database to communicate with external programs, as opposed to having one consolidated database. The utilisation of Palms increases accuracy immensely, and eliminates the need for memory work.
- c) **Purchased Software Solution** – There are a number of companies in the business of Customer Relations Management. (CRM) Packages that support anything from web-access to full-fledged Enterprise Resource Planning (ERP) modules are available to service the needs of our set criteria. The obvious and most important downside to this solution is the cost. These packages are expensive to buy, maintain, and to implement. Consultants must be hired to determine optimal settings, equipment must be bought to satisfy resource requirements, and license and support fees must be regularly paid. An ERP solution for CRM, however, would make the system entirely expandable and ready for future integration with other ERP modules.

Analysis of Alternatives

Costs

To determine which of the alternatives will be most suitable for our requirements, we first examine the costs of each choice, including the system as is.

Cost of Current System	
Re-research And Information Seeking	\$46,153.85
Lost Contracts	\$450,000.00
Totals	\$496,153.85

Re-research figure is based on an estimated salary of \$80K x 15 managers (management themselves must do the research on their clients), 20 hours of duplicating work per contract, 4 contracts a year. One contract lost per year due to the inefficiency of the current system, given a lower bound figure of \$450K. The total cost, therefore, is almost \$500K per year. All figures are taken from estimates given by Louis Veermeersh, Contracts Program Manager at LSC, during our group interviews.

Cost of Alternative Solutions	
Alternative	Implementation Costs
Custom Designed Software	\$85,000.00
Custom DB, Palm interface, Third Party Scheduler	\$64,000.00
Purchased Software Solution	\$250,000.00

Custom Designed Software Cost – To develop the package, we estimate two full time programmers (C/C++, DBMS, SQL), working on contract for 6 months. We require also a web developer (JAVA, HTML, XML) to design and code the secure interface. Information retrieved from www.workopolis.com and www.monster.ca show average salaries of \$60K for a software developer and \$50K for a web developer that suits our needs. (Experience, Skill-set, etc.)

Custom DB with Palm Cost – Palms are bought off the shelf, the midrange model is sufficient for our database/scheduler needs. (2MB of memory, approximately \$400 each) 10 Palms are needed for rotation, 10 managers will go on business trips at any one given time. One programmer specialising in Palm and Microsoft or Novell applications (Outlook or GroupWise), also another for developing the database and interface. As above, the respective average salaries are \$60K and \$65K. We will need them for 6 month contracts to complete the project before the next fiscal year deadline.

Purchased Solution Cost – In the process of searching for Contact Managers, we came across many independent companies selling software packages with either minimal or partial likeness to what our requirements demanded. (Sage Software, Web Contact Manager, Telemagic) A group decision was made to the effect of neglecting these programs in favour of larger, scaleable Customer Relations Management Software Suites. We decided that programmers could be acquired to create more suitable programs than those of the smaller companies, but implementing a full Enterprise Resource Planning compatible system would be much more beneficial to future LSC IS infrastructure upgrades. Contacting SAP and Vantive suggested an average approximate quote of \$250K, including training and implementation.

From the breakdown above, assuming that implementing one of these solutions will eliminate the lost contract per year due to negligence, it is clear that any solution would be financially beneficial and the results apparent within a short time frame after implementation.

Continuing to the next stage of study, below is a comparison of the alternatives with respect to our set criteria.

Alternative Solutions by Criteria									
Alternatives	Developmental Costs	Implementation Time	Interface/Usability	Data Accuracy	Scheduling Capabilities	Training	Security	Maintenance	Total
									Current System
Web-based Custom application	2	2	5	3	2	5	3	5	27
Custom DB using Palm as interface	3	3	4	5	5	2	5	4	31
Purchased software solution	1	4	2	3	2	3	3	1	19

Each category has been given a value from 0 to 5, with 0 being poor and 5 being excellent. The Totals column shows the total rating out of 45 for each alternative. A higher score indicates a better solution and one that is preferred. From this table, it is shown that the second alternative, a Custom Database with Palm interface and Scheduler, outperforms the others overall. A table listing detailed reasons for the grading assignments above can be found in Appendix A.

Alternative Solutions by Criteria and Weighting									
Alternatives	Developmental Costs	Implementation Time	Interface/Usability	Data Accuracy	Scheduling Capabilities	Training	Security	Maintenance	Total
									Weighting
Current System	5	5	0	0	0	5	1	0	16
	0.75	0.5	0	0	0	0.5	0.15	0	38%
Web-based Custom application	2	2	5	3	2	5	3	5	27
	0.3	0.2	0.5	0.45	0.3	0.5	0.45	0.5	64%
Custom DB using Palm as interface	3	3	4	5	5	2	5	4	31
	0.45	0.3	0.4	0.75	0.75	0.2	0.75	0.4	80%
Purchased software solution	1	4	2	3	2	3	3	1	19
	0.15	0.4	0.2	0.45	0.3	0.3	0.45	0.1	47%

Management has also associated weights of importance with each of the criteria required for the proposed solution. These weights have been worked into our comparison table, with the results highlighted. The Totals percentage is the efficiency percentage of the respective alternative,

again showing the Palm solution to be the preferred route. With such strong supporting data for the Palm alternative, the analysis will continue in that direction.

Cost/Benefit Analysis

Below is a table that analyses the time it takes to regain project costs for deciding on the Palm solution. Assuming a 12% Annual Discount Rate, Operational Costs at \$800 a year to replace 2 malfunctioning Palms a year, an increase of one contract gained through the corrections of the new system in the first year, and one additional contract in each following year, the results are as follows.

Cost Benefit Analysis					
Cash Flow	0 Months	6 Months	12 Months	18 Months	24 Months
Dev. Costs	-\$64,000.00				
Oper. Costs		-\$400.00	-\$400.00	-\$400.00	-\$400.00
Present Value	100.00%	94.50%	89.30%	84.30%	79.70%
Time-adj Costs	-\$64,000.00	-\$378.00	-\$357.20	-\$337.20	-\$318.80
Cumulative Costs	-\$64,000.00	-\$64,378.00	-\$64,735.20	-\$65,072.40	-\$65,391.20
Benefits	\$0.00	\$225,000.00	\$225,000.00	\$450,000.00	\$450,000.00
T-adj Benefits	\$0.00	\$212,625.00	\$200,925.00	\$379,350.00	\$358,650.00
Cumulative Benefits	\$0.00	\$212,625.00	\$413,550.00	\$792,900.00	\$1,151,550.00
Net Costs+Benefits	-\$64,000.00	\$148,247.00	\$348,814.80	\$727,827.60	\$1,086,158.80

By this calculation, all costs will be returned within the first year of the system in operation. (Based on management's assurance that one contract every year is lost strictly due to lack of organisation on LSC's part)

The Best Alternative

Clearly, by the Alternative Criteria Comparisons earlier, the Palm solution is the best choice. The above table also shows total costs recovered in a phenomenally short time, and the entire system can be created from start to finish within the time frame allowed. Financial viability is definitely high, in comparison to the dollar estimate of what the current system is costing LSC presently. The Palm choice offers flexibility with the compatibility and portability of commercial products such as Outlook and Palm OS, while leaving any needs for additional customisation and function to internal developers. In this way, a solution can be created to match management needs that guarantee modularity as well as data integrity. Time consuming beta testing is also minimised as a result, with problem detection becoming a speedier process.

Recommendations

From facts provided above, the recommendation of this report is to implement the described Palm solution. There are four main steps in completing this task.

- a) Design and create an interface that maximises user productivity – Survey users, find out most common operations performed by managers (entering business cards, checking schedules, writing action items, etc), and from it, determine the most intuitive program flow design. Users will not utilise a package with spectacular features if none of them are useful.

- b) Acquire programmers to develop a secure database, can be done in Access since we have < 20 users and not an extreme amount of data. This database will control all contact information and will generate all the information needed to control a third party scheduler. The interface created in part a) will be fused into the database upon completion (VBA if using Access). The database must encompass extensive searching capabilities and fully tested to retain data integrity. A backup procedure must be developed to fail-safe the database.
- c) Palms must be purchased, and developers must be brought in to interface the PDA with the custom database as well as with the third party schedulers. These will be proprietary programs and may need continual updating. If the hired developers are contract only, an internal LSC employee must be part of the creation process to ensure technical support in the future.
- d) Users of the system must be trained on using the Palms, taught how to function them efficiently and how to sync them with the shared database upon arrival. They must be comfortable with the workings of the software package as a whole and become accustomed to using the extra scheduler functions.

Conclusions

Based on the above observations, we see undoubtedly that the Palm alternative is the best choice for replacement of the current system. It is minimal in cost, substantial in benefit, and its implementation is scaleable as the requirements and specifications grow in the future. The functions of the new system will allow for increased organization and planning, resulting in a more professional approach to clients and many more successful bids for important contracts. Reports and statistics can be gathered about contacts now that they are stored in a common database, and smarter uses of this data can be explored. In comparison to the old system, or lack thereof one, productivity is increased hundred-fold while keeping costs relatively low.