Technology Modernization

Client

ClientX Transport Services, Inc., one of the largest transportation logistics companies in North America, provides safe and reliable transportation services to a diverse group of customers throughout the continental United States, Canada and Mexico. Utilizing an integrated, multimodal approach, they provide capacity-oriented solutions cantered on delivering customer value and industry-leading service.

ClientX was incorporated in Arkansas on August 10, 1961, and have been a publicly held company since our initial public offering in 1983. Their service offerings include transportation of full truckload freight, which we directly transport utilizing our company-controlled revenue equipment and company drivers or independent contractors. They also have arrangements with most of the major North American rail carriers to transport truckload freight in containers and trailers.

ClientX operates 5 lines of business known as the business units. Each business unit operates independently but at the same time supports and complements other business units.

- **Truck Load:** This segment (also referred to as Van) includes full truckload, dry-van freight, using company-controlled tractors operating over roads and highways.Trucking although the original business unit is currently the smallest, constitutes about 6% of the business, and is no longer the core of the business.

- **Intermodal:** The ClientXI segment began operations in 1989 with a partnership with the former Santa Fe Railway (now the BNSF Railway Company). Essentially, ClientXI draws on the intermodal (also known as "container on flatcar") services of rail carriers for the underlying line haul movement of its equipment and performs the pickups and deliveries ("drayage") for customers at the origin and destination rail terminal locations. May directly provide the drayage service at either the origin or destination rail ramp using company-controlled tractors, or they purchase these services from third parties. This segment has characteristics similar to Truck in that orders are always occupy the full container, and covers a defined lane (i.e. origin to destination). The Intermodal business is the biggest and constitutes 60% of the revenue.

- **Dedicated Contract Services (DCS):** provides customized services that are governed by long-term contracts and currently include dry-van, flatbed, temperature-controlled, dump trailers and local inner-city operations. The traditional DCS are generally full truckload orders which have a dedicated fleet of equipment to fulfill all a customer's orders. Final Mile Services (FMS) is separately managed.

- **Final Mile (Managed by DCS business):** This segment includes working with corporate customers such as Whirlpool to deliver their loads from the local distribution centres to the final consumer or customer. ClientX FMS orders generally involve Penske RDCs and Shuttle (i.e. defined route which moves product from Penske RDC to ClientX LDC).

Both DCS and ICS are considered growth businesses. Each business has its own sales personnel and owns its equipment that includes trailers, trucks and containers.

- 90 local distributors in Final Mile
- 66000 containers
- 25000 trailers
- 12000+ trucks
- 40 Maintenance Domiciles for equipment maintenance
- 12 Virtual ClientX business teams to review and improve business processes

The core values of ClientX include delivering Customer Value, People, Innovation, Sustainability, Safety and Technology. ClientX focuses on safety and ensures that it hires the best drivers in the industry. The CEO's vision is to create an "Elite Wow and Process" experience for their customers. ClientX customers are looking for lower costs, capacity on demand and great service. ClientX has been active in sustainability solutions through its participation in the Carbon Disclosure Project and the EPA initiated Smartway Program.

Problem Statement

ClientX plans to 'double' its revenue from the current 6 billion to 10 billion by 2020 (aka "1020"). The key goal is to gain business agility by introducing new products and services, the ability to register new customers and orders in short cycles, cross line of business orders and operational excellence. However, all this is limited by an aging mainframe that costs tremendously for MIPS, archaic programs written in the 80s in COBOL for the trucking division that since has been extended for other LOBs and a DB2 database with poorly engineered data models.

Challenge

The major concerns to meeting the growth objectives come from the current technology environment. The business is changing and the current technology is not able to keep pace with that type of change. The major goal of IT is to move off the mainframe in 5 years to a new target platform.

The options available include:

- Forklift the existing environment consisting of Micro-Focus Cobol programs and DB2 to a new target platform, but it does not provide any additional value other than reduce mainframe costs. This option has also been overshadowed in benefits by a re-negotiated contract with the mainframe vendor that has reduced mainframe operating costs
- Migrate components of the mainframe by leveraging new technology, rewriting components in newer languages, utilizing leaner and flexible database technologies, and using a service driven approach

iT people

Challenge (cont.)

The current Business Processes are not well documented, the system has plenty of code written through the 80s and 90s in the existing asset base that needs to be cleansed, many of them re-engineered to meet today's agile environment. Some data still exists on VSAM, but the goal is to move both VSAM and DB2 data to a target database technology with a well defined and scalable information model. The existing applications have been wrapped with workarounds to meet evolving business needs such as '11:12' and '11:11' codes, dummy drivers, dummy trucks etc. Business terms have been loosely used across the business units such as 'Load', 'Shipment', 'Order', 'Offer', 'Opportunity' and 'Customer Request' with slightly differences in meanings. The ClientX systems cannot handle more than 18 stops at a time and hence system limitations force them to band-aid by splitting such loads or orders.

IT has formed a group 'Mainframe Independence Team' to devise a strategy to enable the migration strategy. The team has enabled some modernization by leveraging Java and .NET technologies, developing point-to-point web services and moving some of the mainframe "Green Screens" to web based interfaces. The order management screens have been migrated to web interfaces, while the monitoring and appointment screens are still green. A concern is that the web interfaces may not provide the usability and ease of use of green screens. While new employees love the web based interfaces, legacy employees still love the traditional screens.

There are about 1500 – 2500 mainframe users per day accessing all kinds of functionality, of which about 500 are involved in booking orders. About 16000 – 20000 order numbers are consumed per day of which 1/3rd is received via EDI, 1/3rd is received via the ELT Spreadsheet Freight process and 1/3rd is manually processes through the Enterprise Order Management system aka EOM. Most EDI orders are 'Auto Accepted' and is typically driven by customer contracts. EDI Manual is driven by completeness of incoming EDI information which is driven through the manual process. DCS EDI and DCS ELT Spreadsheet based orders have more volume but less in terms of revenue. The existing order management modules are built for carrying full truck loads but Last Mile Customers don't send full truck loads.

The order management applications and/or modules are primarily used by internal J B Hunt users such as Account Representatives who interact with the customers. Customers intending to directly place orders with ClientX use TMS to book Loads. The TMS booked orders is expected to grow supporting primarily the Intermodal and ICS businesses in terms of volume though in terms of value they may be low.

ClientX has a long term 5 year goal of moving all of its applications off its mainframe computer. ClientX has assembled a team to drive the effort to migrate one of its applications, Order Management (OM), from the mainframe to modern technologies in 1 year.

The success of this project will determine the direction ClientX takes with regard to the mainframe for the balance of the 5 year timeline. The assembled team is made up of managers, SME's, project managers, and technical resources that have had extensive hands on experience with the current OM system.

This team, while highly skilled in its current areas of expertise, recognizes its lack of experience with modern technology software stacks which are seen as highly correlated with the ultimate success of the 1 year project.

Solution Strategy

- ➡ Conduct a discovery around the current environment that includes existing infrastructure, applications, application programs, information architecture, user interfaces and other aspects
- ➡ Develop an architectural approach with minimum impact to the business to meet goals outlined along with prioritized recommendations
- ➡ Prepare a detailed first year plan with estimated plan and cost models for the remaining 4 years
- ➡ Conceptualize an implementation strategy, resourcing plan and cost model
- ➡ Secure management buy-in and funding

Technology

The environment consists of a mainframe running over 8000 legacy COBOL programs with a DB2 database. In addition, some applications have been written in .NET and Java/J2EE and integrated with the legacy environment.

Consulting Value Add

- As per ClientX budget and schedule constraints, a detailed three week discovery session was conducted with their subject matter experts, followed by a three week analysis of potential architectural options, implementation strategy and phased five year cost
- A review of all the provided documents and interviews was performed using 'Top Down', 'Bottom up' and 'Meet in the Middle' techniques to arrive at a potential list of candidate services
- The current scope of implementation and a detailed Platform Requirements Statements was prepared for use in the RFI/RFP process
- Assisted in the vendor selection process, and provided use cases for piloting vendor capability critical to the target solution
- Prepared a hybrid execution plan combining traditional waterfall and an Agile Scrum/Sprint approach
- Modeled a resourcing plan blended with consultants, vendor technology experts, managed services consultants, contractors and ClientX resources to optimize project cost
- Tailored the Scrum/Sprint approach to accommodate client's current resource skill levels and familiarity with agile approaches

Business (IT) Value

- One of the critical aspects of putting together a solution was to make sure that all the investments in existing business processes and business rules are not lost, while at the same time all dead wood is identified and eliminated from the target system.
- A phased implementation plan that de-risks any impact to the business was devised using "Service Oriented Architecture" and "Event Driven Architecture"
- Distributed architecture to support each business unit's unique business rules and process variations, yet share common information architecture to support cross LOB orders
- A modern platform based on Open Source Red Hat technologies with a subscription model that required payment only for production instances at the time of production deployment
- Utilizes savings from mainframe lease costs to implement new architecture and technology thus helping move towards the 1020 Vision
- Given the tight schedule, proposes very minimal process re-engineering or usability re-engineering

IT people

Project Execution

- Considerable effort was put to bring project costs under a certain threshold to make it palatable to the CFO and the executive leadership even though, it was strongly advised against doing so

- The project had to be put on hold by the Client as the desire to show quick results to the business and upper management quickly overshadowed the principles, policies and guidelines put in place by the execution plan to make the project a success

Lessons Learned

- Do not deviate from the established and agreed plan even if the customer forces change for reasons that cannot allow adjustments to the plan (resource, schedule and cost)

- Resources must be assigned to the project with the requisite skills, not just warm bodies

- Agreed to training plan must be implemented

- ClientX must adhere to clearly established RACI model with unique accountable people making key decisions

- Assigned architects and consultants must possess true architectural and leadership skills, rather than focus on their tactical ambitions

- Established SDLC must be followed, and the entire project must be guided by Solution Architecture, Platform Architecture and a Reference Architecture. Though these were delivered, client's architects on the ground were never supportive nor contrinutory to these guiding documents

- The Information modeling team lead by Data BluePrint ran into early problems due to the lack of available SMEs, and information provided during the assessment phase was not complete. Prioritizing information model architecture prior to other phases of the project is critical to project success. Information such as smart-codes (field value driven business logic) can derail architectures if not understood upfront.

Customer Contact

- This paper is based on the Lead Principal Consultant's role on the project

FOR MORE INFORMATION

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