Large Scale Global Data Migration

Case Study
CCE's outsourcing strategy consists of three elements:

- **Philosophy:** Risk Management
  - Task Selection – Leverage chore to accelerate core
  - Task Prioritization - Capacity Maturity Model

- **Resources:** Accountability, Quality and Productivity
  - Customer Interface - Local program management
  - Delivery Team - Dedicated offshore engineering team

- **Technology:** Visibility, Control and Productivity
  - Communications - Collaborative work order management system
  - Task Automation - Leveraging technology to automate repeated tasks

A detailed discussion of CCE’s outsourcing philosophy is available in CCE’s White Paper, “Leverage Chore to Accelerate Core.”

This case study discusses how CCE’s outsourcing strategy and its implementation for a client delivered over $2.5 million in cost savings over a period of 24 months, while ensuring 99% of on-time delivery with less than a 1.5% error rate.
While outsourcing chores made perfect sense from a technical perspective, the client had two other challenges that needed to be overcome to ensure success of the outsourcing initiative.

**Outsourcing Challenge - Geographically Dispersed Organization**

The four main product lines of the client in Europe are designed and built in 22 factories, spread over the 12 countries detailed below. These locations account for almost 400 seats of CATIA.

It is a common practice for the client to have multiple locations simultaneously working on the same design project. The “M2” cooker project is an example of this type of collaborative design execution. Divisions located in England, Denmark, and Sweden are concurrently involved in the product design activity.

It was critical for the client that the data migration from CATIA V4 to V5 be seamlessly coordinated between these geographical boundaries without substantial management overhead or productivity loss. It was also important for the client’s managers to understand their technical requirements.

He also obtained the client’s CATIA V4 project files and drawing standards that were used to set up the client design environment at CCE’s engineering center, in Chennai, India.

Arun apprised the client’s managers with CCE’s technical expertise in CATIA V4 and V5 design, modeling, and data exchange processes. He trained them in using CCE’s proprietary, web-based work order management system, Powerlink.

This included setting up password-protected accounts and creating work orders describing the work activity for the offshore team, in India.

Data files were attached to each work order as required. After completion of the work activity by the India team, the delivered data files were downloaded and checked for quality compliance.

This process trained the client’s managers in the mechanism of outsourcing work to CCE’s India team.

After the process initiation, Arun continued to monitor all work orders issued by the client and resolve any delivery issues as required.

He was the client’s single point of contact for any team changes, such as augmenting with additional designers, assigning new type of work requests, etc.

By personally interfacing with each of the client’s managers and investing time in training them in the outsourcing process, Arun significantly reduced their apprehensions about the outsourcing initiative.

**Dedicated Offshore Team for the client**

In consultation with Arun, CCE’s program manager, in India, selected a team of engineers who were cross-trained in CATIA V4 and V5 to form the core team for the client.

These team members were exclusively dedicated to the client’s work, thus ensuring increasing quality and productivity over time as they closely worked with their client counterparts, in Europe. Maintaining the team’s exclusivity ensured that the client’s intellectual property was always protected.

To ensure optimum productivity, swift maturation, and minimal errors, within the team, CCE developed training processes and an organizational set-up.

- The team obtained samples of the work, along with company or industry standards, CAD start-up files, drawing templates, standard parts, libraries or environment files, and completed reference drawings.
Senior team members performed the sample work with feedback between the team, an identified lead client contact who is very familiar with the work, and CCE’s U.S. program manager. Questions were freely asked and answered until all three were assured that the work requests and desired deliverables were clearly defined and able to be completed.

CCE populated the team with the remaining members who were custom-selected with skills pertinent to the client’s work. The initial team members trained the newer ones in the work that had already been completed. As new work continued to be accepted, the feedback loop continued.

The team was structured into CAD engineers, who actually performed the work, and senior Q.A. engineers, who worked to oversee and check the work. A Team Leader lead each team. The team leader and Q.A. engineers provided continuity in case of staff turnover.

After the team was trained, tested, and a client contact was established, we entered into full production mode. The end result was the ability to push through large amounts of work with consistent and reliable results.

Communications Set-up

Communications is the key to the success of any outsourcing program. Email and FTP are commonly-used tools to exchange work specifications and data files between the distance and time-separated work teams. Unfortunately, both are asynchronous tools because there is no guarantee to the sender that the recipient received the information in a timely manner. Email and FTP also provide a low level of security that may not be sufficient when exchanging sensitive product information across national boundaries. Email also creates disconnected threads of communications making it hard to keep track of project progress and enforce accountability. Communicating by phone can also be very difficult due to language differences.

CCE has developed a proprietary, web-based work order management system, called PowerLink, that is made available to all clients to facilitate communications between the client’s staff, worldwide, and CCE’s local program managers and India-based engineers. PowerLink allows all work specifications and data files to be securely stored at a central location that is easily accessible, via a web browser, to all teams participating in the project. All teams have immediate access to the most current information, which includes all technical communications, data and reference files, and progress notes recorded by the engineering team.

PowerLink also includes an internet-based chat system for real-time ad hoc conversations which are vital for quick exchanges of information whenever necessary.

All of the client’s locations, in Europe, used PowerLink to send work to CCE’s team, in India. CCE’s program manager used PowerLink to keep track of all the ongoing work orders to make sure all time-critical issues were proactively acted on.

By continuously monitoring the communications between the client’s teams and CCE’s teams, CCE’s program manager was able to correct information gaps that could have caused quality problems. This continuous maturing of the process led to significant increases in productivity and quality from the CCE team.

The client’s management used PowerLink to track the overall progress of the data migration projects, which included error rates, timeliness of deliveries, quality, and productivity of the CCE team.

Capacity Maturity Model

To minimize risk and to ensure quality and productivity, the data migration from V4 to V5 was planned using a phased approach.

Design Specifics

Phase 1

- Install AutoCAD and Pro/Engineer software at CCE design center, in India, to replicate the client’s environment
- Implement the client’s CAD standards in design procedures
- Obtain specifications from the client regarding desired AutoCAD and Pro/Engineer output
- Begin data migration projects to get a better understanding of the client’s products and quality expectations
- Create associated drawing from model
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Phase 2
- Start supporting change management work by training the client's designers to use PowerLink to send work offshore
- Increase throughput by placing experienced CCE engineers at the client's locations to perform on-site coordination duties

Phase 3
- Increase throughput by analyzing and optimizing the existing process of outsourcing
- Employ design automation to increase productivity with improved quality

Work Summary
Over the course of the project, CCE delivered 250 work orders.
The nature of the work included the following:

CATIA Version 4 Design
- Creating 3D model and 2D drawing from a 2D drawing in PDF format
- Creating 3D model and 2D drawing from a CATIA V4 2D drawing
- Completing an incomplete solid/surface model
- Creating 2D drawing from a completed solid model
- Creating a modifiable feature-based 3D model based on an existing dumb solid model

CATIA Version 5 Design
- Creating 3D model and 2D drawing from a 2D drawing in PDF format
- Creating 3D model and 2D drawing from a CATIA V4 2D drawing
- Completing an incomplete solid/surface model
- Creating 2D drawing from a completed solid model
- Creating a modifiable feature-based 3D model based on an existing dumb solid model

CATIA Version 5 Migration
- Resolving inconsistencies between 3D and 2D in V4 by creating complete feature-based 3D model and associated 2D drawing in V5

All 2D drawings include full detailing in compliance with the latest client CAD standards.

Quality Metrics
The client was very satisfied with the quality of the V4 and V5 design work, which were both new designs and created from translations.

There were minimal rejections of deliveries due to inferior quality.

Less than 3% of the deliveries were rejected due to an error by CCE in meeting the specified requirements.

Most re-work was performed due to updating the specifications, post-delivery, by the client's engineers.

Timeliness of deliveries exceeded the client's expectations.
Task Automation

One of the unique strengths of CCE’s offshore center is the synergistic co-location of engineering design and CAD/CAM software development personnel. This enables CCE to improve and/or use custom-designed CAD/CAM/CAE tools to fit a particular project need.

After the migration of CATIA V4 data to V5, it was necessary to identify and remove unused entities, such as points, planes, and sketches. Rather than manually perform this time-consuming activity, CCE adapted a CATIA utility, called CATDUAV5, for this purpose. The automation of this chore activity resulted in significant time-savings with improved quality.

CCE also developed a custom tool to identify the optimum way to create parametric surfaces in V5 from V4 surfaces. This simplified the surface creation process with significant time-savings.

Continuous Improvement Program

CCE is a process-driven company. All work practices and communications are constantly monitored and structured. Tasks are measured and compared against industry standard benchmarks. Some of these measures include:

- Constant updates of the quality control checklist.
- Identification of opportunities for task automation.
- Reviewing completed work to find ways to further improve the process.

“We are very happy with CCE services in this data migration project. CCE’s global team, knowledge of industry best practices, and design automation tools made this transition very smooth. CCE’s team members also helped train our designers in CATIA V5 processes, accelerating the move from old to new technology.”

-VP of Engineering
Home Appliance Manufacturer