

Introduction

The time that the typical supply chain was just a simple linear chain of events that had to take place in order to get a product to market is definitely over. In the age of the Internet where the OEMs have many partners and suppliers in which to outsource, one can speak about the “global dynamic supply web”. In the Electronics Industry, this supply web has several components to it, all of which rely on others to have the most accurate and up to date information on a particular product specified, available 24 hours a day, 7 days a week from anywhere on the globe.

In order to bring products to market faster, more accurately and with a higher quality, it is necessary to maximize the efficiencies of collaboration among OEMs, CEM's, Design Service bureaus and other suppliers of different disciplines. The most difficult challenge with this model is the ability to effectively manage communication of all project information from conception to fruition and finally to funeral. This requires a robust, technology independent data management and e-collaboration infrastructure, handling all fire wall and data communication issues and offering secure collaborative workspaces and communication lines. It should include flexible and professional Product Data and Product Lifecycle Management (PDM/PLM), including project, task and content management as well as configuration management for both products and tools. Also management of related unstructured data (e-mail, fax, (web)meeting reports, etc.), is becoming increasingly important in the product realization process and traceability requirements. The current solutions tend to be very inefficient if existent at all.

Streamlining these project communications will, in turn, enhance product realization efficiency by reducing time to market and exponentially increase profit.

The benefits to embracing e-collaborative communication throughout the supply web are simple:

- Project management independent from organization, location and time,
- Eliminate product development inefficiencies,
- Reduce product development and production engineering costs,
- Reduce production costs,
- Excellent product quality.

Resulting in,

- Shortest time to market
- Shortest time to profit
- Increased profit
- Increased competing power in a global environment

CXInsight for Electronics provides a solution to industry demands by enhancing the capabilities of all members of the supply web, offering an effortless solution for collaboration via the Internet. CXInsight is a software tool, which enables high velocity, business-to-business (B2B) Engineering Collaboration. Effective B2B Engineering Collaboration for the electronic supply chain creates the following business value:

- Increasing revenue by improving team productivity through streamlining administrative procedures, eliminating non-value added work (travel), simplifying approval processes and automating workflow.
- Facilitating data control by providing tight security and a permanent audit trail of document access and decision making through the project life cycle.
- Eliminating geographic barriers by creating an interactive environment where all project team members collaborate on project information regardless of physical location and time.
- Enhancing system integration with **all** members of the supply web creating favorable relationships with **all** internal and external project collaboration partners.

CXInsight is an Internet B2B Engineering Collaboration Application Software that connects project teams, intercompany workgroups, design teams, buyers and suppliers worldwide. Being an integrated, real-time Internet based solution, CXInsight allows for global engineering by anyone, anytime, anyplace.

The CXInsight Server allows an OEM and its supply-chain partners to collaborate in a secure and compartmentalized environment. OEM members access content and files from within their network while supply-chain partners do the same through the Internet. Partners interact with each of their customers separately, albeit through the same username and password but with different authorization levels and access rights. Using the latest Internet-based collaboration technologies, CXInsight delivers:

- collaboration for Product Change management, Design for Manufacturability communication, WIP, Quality and Traceability information as well as sophisticated Content management. This secure, web based technology serves as a virtual meeting place for the supply chain partners, facilitating all collaboration operations.
- The CXInsight software platform also provides services for open data viewing in different formats to review manufacturing issues during the electronic or mechanical design and manufacturing processes.
- The CXInsight collaboration network is where all project members access content and files that are stored on the CXI server. This arrangement allows all members, whether OEM or fabricator, to communicate and share information. Supply-chain partners get a federated view of their collaborative landscape, being able to seamlessly move between customer collaborations.

Electronics enterprises must respond to business drivers such as reduced time to market, increasing global competition, technological innovation, distributed operations, processes and cost control in order to remain competitive in the dynamic global economy. In order to effectively fulfill these requirements, organizations must develop procedures to coordinate their internal operations as well as external enterprises. This challenges the organization's internal processes and infrastructure; as it now requires colleagues to constantly communicate and exchange ideas and information. In an effort to address these issues, many organizations are broadening the focus of their business model to include synchronized collaboration among all contributors to their supply web. Organizing all aspects of internal engineering and/or manufacturing processes, as well as external suppliers and distributors is an enormous effort and leads to an overwhelming rework of embedded processes. Currently, the term collaboration includes a lot of unstructured data like e-mails, faxes, phone calls, and voice mail messages since it includes the product development process from the concept through manufacturing, distribution and services. CXInsight has a solution to these entrenched processes making them a distributed and collaborative work environment.

Business optimization systems enable corporations to have over the Internet, direct and real-time integration with all suppliers, distributors, CEM's, and any other group. This particular functionality of CXInsight is an Engineering Collaboration Application Software that provides an environment where teams can work together in real-time, in an online shared session to collaborate on a specific project. Here, information is spread throughout the supply web in a secure working environment. This situation allows for project managers, design engineers, suppliers, and other team members to review and evaluate projects simultaneously, sharing ideas and solutions to conflicts. By utilizing the CXInsight platform, supply web processes are streamlined creating a collaboration environment that fulfills previously described business drivers.

More than just a way of taking time out of a business process, Zero Latency strategies determine ways to link the processes that occur in different departments, different locations and even different enterprises in faster, more closely knit ways. This

Global Electronic Engineering Collaboration Model

accelerates certain business processes and results in streamlined, time-sensitive operations, reduced costs, and increased sales and customer satisfaction. It is applicable where the value of information depends on its timelines and where multiple departments or multiple companies work together on the same business process.

Possibly the most difficult aspect of this new model is driving corporations to change their current processes. Instead of the rigid, hierarchical organizational structure that so many companies adopt, a more fluid and virtual form of organization is needed to make the collaboration efforts succeed. In this concept, the work is more focused on team processes and less on individual tasks. This makes the decision process more decentralized allowing teams and team member's empowerment regarding project flow, eventually improving the scope and timeframe of the project. Now, projects are completed faster and much more accurate and complete and with less errors than before, because of the availability of crucial information previously hidden in the different companies in the supply chain. In order to overcome the obstacles that barricade a current organizational structure from transitioning into the new Internet collaborative archetype, corporations need to understand the benefits associated with a migration to this model. The benefits of using a collaboration technology include improved information quality, time, and cost benefits that can quantitatively improve processes. While improving quality, better decisions can be made as a result of all team members collaborating in the same session exchanging ideas, sharing information and openly communicating faster with partners and suppliers. Finally, by reviewing and conferencing online, the costs associated with time and travel are greatly reduced. In turn, this reduces the cost of finished product.

Manufacturers recognize that NPI [New Product Introduction] and ECO handling constitute their next major challenge. Even the best companies have only an ad hoc collection of tools and procedures to automate the flow of information. CEM's [Contract Electronics Manufacturers] have the additional burden of not controlling the whole process and having to receive data from their customers' systems. One of the main problems facing the electronic supply chain partners is the lack of structured tools for collection and follow-up on Design For Manufacturing (DFx) issues. These issues can stem at different stages of the product life cycle and include bad selection of components, mismatch between the BOM and CAD data, improper placement of components for assembly or rework and for bare boards mismatch between net list and copper data, annular ring violations, line spacing violations, etc. These errors caused by inefficiencies during the engineering process cost time and can be very expensive. The CXInsight strategy is to alleviate these inefficiencies within the electronics supply chain (web) by offering all the a.m. functionality and by facilitating shared data and communication between Design Engineers, Manufacturers and Suppliers through a common platform via the Internet.

What is Needed in Engineering Collaboration?

The process of outsourcing the manufacturing of an electronic product is a complicated exercise of balancing a large set of constraints. As the electronic industry moves more and more towards the full outsourcing model, the need for close collaboration between different companies across the supply web is rapidly growing. At the same time, the audience which is involved in the decision making process within each supply chain partner grows as well.

CXInsight provides a rich collaboration environment for supply chain partners in the Electronic Design and Manufacturing world. Using the latest Internet based collaboration technologies,

CXInsight delivers many services to enhance collaboration from project concept to completion. Using secure, private rooms that serve as a virtual meeting place for the supply chain partners facilitates all these operations.

The CXInsight collaboration system is based on a highly secure and organized set of rooms or containers for a rich set of objects, including data files, documentation, tasks, e-mail communication, discussions, online meetings, calendars and more. These rooms facilitate data distribution, collaborative problem solving, and change notification enabling supply chain integration, concurrent product development and much more. Rooms can be created to handle a specific product or project, from large, hierarchically structured assemblies down to the single printed circuit board. Also, many operations from the platform can be configured to be pre-emptive, as in to generate alerts to specific members upon an automatic or manual event or execute formal release-to-production activities. These alerts are extremely instrumental in preventing wait time and expediting the design to manufacturing process.

When the right hand knows what the left hand is doing at every moment, the possible efficiencies and opportunities for enhanced revenue and better-customer service are enormous. The term Zero Latency refers to any enterprise strategy that involves both the identification of a business goal and the application of technology resulting in instantaneous awareness and appropriate response to events across the entire organization. These strategies exploit the immediate exchange of information across technical and organizational boundaries to achieve business benefit. In addition, what makes the CXInsight unique is a set of specially designed vertical services providing Electronics OEMs and manufacturers tools for reviewing a design in detail, summarizing problems and solving them, and tracking valuable information across the supply chain. Graphical viewing is used to achieve an unprecedented level of visibility for the product and the enveloping processes throughout all cycles. All of these tools provide the users with the capability to view, manipulate, and communicate geometrical data and its associated descriptive information making product change and collaboration easily attainable.

An Engineering Collaboration platform provides:

- A common environment for defining and viewing all aspects of product data.
- The ability to collaborate with the other members of the team, propose alternative solutions, comment on the change or the implementation plan, and conduct and electronic approval process.
- A tracking mechanism for changes occurring throughout the product development process. Also, the ability to analyze the impact of the proposed change, and browse other relevant information about the impacted products, parts, and documents, as well as the change history for any related parts or products.
- An easy way to implement these changes by updating the product configuration at the source, in the database, to reflect the agreed changes. A key part of this is the ability to publish the results in real time with all members of the supply chain.

The goal of a Zero Latency communication and software infrastructure is to reduce information "float" or the time between when data is captured in one place and when it becomes available and usable ("actionable") in another place in the system. Zero Latency strategies have emerged more predominantly at this time because the combination of technologies that enables them has become widely available. As the outsourcing increases on the global level, the goal of CXInsight is to facilitate collaboration by furnishing team members the opportunity for viewing information, redlining capabilities, and promoting discussion around the pertinent datasets flowing between members of the supply chain. Features contributing to attaining this goal include: Data Sharing, Discussions, Online Workflows, On line Tasks, Calendar and Online Meetings, Online Conversing, Activity Logging, and Open Data Management.

Relevant datasets collaborated on via CXInsight include:

- BOM (Bill of Materials)
- AVL (Approved Vendor List),
- SCH (Schematics),
- CAD-E/M (Computer Aided Design).

Collaboration Security Model

Members are required to enter a member name and password upon the initiation of an CXInsight session. Each member of a CXInsight project is invited to the project and is assigned a unique member name and a role. All authenticated member connections to CXInsight services are secured using SLL over HTTPS. This means that all transmissions between client and server are encrypted using 128-bit keys. That is how member names, passwords and data are protected.

Summary

CXInsight provides maximum benefit to companies looking to improve the efficiency of their supply chain. By sharing product data within the manufacturing enterprise and throughout the supply chain, companies drastically reduce time and cost, resulting in increased revenue. CXInsight offers a unique Engineering Collaboration Application Software Platform for the Electronics Industry providing technology that allows users to view, manipulate, and communicate data and its associated descriptive information.

About CXInsight Inc.

CXInsight is a development of Armida B.V. and Adeon Software House from The Netherlands. CXInsight focuses on the Business Process and offers a vital ingredient for Business Collaborative Management (BCM), an area that is quickly becoming the success defining factor for Electronic OEMs.

With this shift, CXInsight have migrated to this advanced method of thinking, introducing a solution covering the product lifecycle from Design to Engineering to Manufacturing to Support. This strategy is in line with current business trends whereas industries are no longer focusing on the development of a product, but on the collaborative efforts within the context of a business process that it takes to complete a project in the most effective way.