

the product record

PRODUCT LIFECYCLE MANAGEMENT QUARTERLY

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OUTSOURCING

On The Record

An Exclusive TPR Interview with
Norm Fjeldheim, CIO, QUALCOMM

How do you perceive the state of maturity in the cell phone industry?

The cell phone industry is still in a high growth stage. According to a recent Gartner report, 779 million phones will be sold next year, and one billion by 2009. We still have plenty of growth ahead as markets, such as developing nations in Asia, start to really adopt cellular technology. We are seeing double-digit growth in cell phone sales in China and India, for example.



QUALCOMM

How do you expect cell phone technology to progress in the next few years?

High-speed data access is being rolled out now. Sprint is talking about making high-speed data available to any device on the network — laptops, cell phones, smart phones and PDAs — by next year. High-speed data is going to enable all kinds of services, including Verizon's V CAST, which is essentially television on your phone. QUALCOMM is working on a technology that turns your phone into a Tivo. Video content will be distributed to the phone and stored there so you can watch it later.

Will these applications require larger screens on handheld devices?

We are seeing a transition. A few years ago the trend was toward ever smaller phones. That trend has reversed very fast, and we are now seeing larger color screens.

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MADE IN TAIWAN

Examining Taiwan's Leadership in ODM Outsourcing

By GRACE GUO
Inventec Appliances Corp.

Taiwan is the top location for outsourcing to ODMs (original design manufacturers) — representing 15% of worldwide electronics manufacturing — and Taiwan is home to the fastest growing ODM companies. What is it that enabled Taiwan to rise to this prominent position in the global electronics market?

Initially this success was based on the fact that Taiwan provided a low-cost location for manufacturing. Taiwanese companies also offered speed, flexibility, and logistics management to support customer demand. Subsequently, Taiwan has been able to provide design services as well, due to local resources with strong technical capabilities. Other factors contributing to Taiwan's growth include the proximity to manufacturing facilities in China, and Taiwan's central location in Asia, which is convenient and economical for international shipping. Together, these factors have made Taiwan a hub for outsourcing manufacturing and design.

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On The Record

An exclusive TPR interview with Norm Fjeldheim, CIO, QUALCOMM

What are the next big trends that are going to catch on?

In addition to camera phones, video phones are now coming out, which turn a phone into a camcorder, enabling you to not only watch video, but also record it and send it to someone.

IM (instant messaging) is also taking off like crazy. The younger generation, twenty-somethings and teenagers, use the phone more as a data device — IMing, emailing, and sending pictures and videos to their friends — than a traditional phone.

Do you expect convergence of technology to continue or to fade out?

This trend will continue as we will be able to use phones in place of TVs, computers and gaming consoles. Another trend I believe you will see is the iPod and a phone converging. Your phone will become a music player. You will be able to store thousands of songs on the phone, downloaded directly off the Internet.

What drives these trends?

The consumer market demands access to more entertainment and the ability to be connected to friends and information sources like blogs on the Internet.

What factors do cell phone companies compete on?

Form factors are the key. Different phones succeed or fail depending on how easy they are to use. Phones are able to perform so many different functions, but if they are not easy to use then they don't really take off.

Another important competitive factor is the ability to react quickly to changes in the market. For example, Nokia used to produce a candy bar style phone, but then the foot phone trend started taking off. Nokia was slow to react to that change in the market and lost a fair amount of market share to manufacturers producing solid models in the new form factors.

As a global leader in this industry, what do you focus on to maintain your leadership position going forward?

Listening to the customer. Our customers are the manufacturers, but also ultimately our customers are the carriers and the consumers. So we pay a lot of attention to what kind of capabilities people want on their phones, and then enable our technology to support that. We are adding more features to our chips, giving phone manufacturers a range of options — such as graphics, multimedia, high-speed Internet— so they can offer more choices to the consumer.

What is your outsourcing strategy for design and manufacturing?

For design, we have opened up engineering offices around the world in high tech centers in India, China and Europe, to get all the talent we can. From a manufacturing standpoint, we are the world's largest fabless semiconductor company, so we don't own our own fabs, we contract with fabs to produce our product. We leave the manufacturing to other companies that can do that well. So we don't have the capital investment of owning the fab, yet we have the same capabilities from these contractors all around the world. That has been a significant factor in our success.

How does Agile PLM support your outsourcing strategy.

Agile PLM is a global system used by our entire company. We also provide access to product data to our suppliers through the Agile portal and an Oracle portal integrated with the Agile database. We have to share information with our suppliers, to show them how to build our products. It is a critical part of our business. ☺

Norm Fjeldheim is the Senior Vice President and Chief Information Officer for QUALCOMM Incorporated. He oversees all aspects of QUALCOMM's information technology for all of the company's diverse business units. Under his leadership, QUALCOMM IT was honored by CIO magazine as one of the RESOURCEFUL 100, in August 2003.

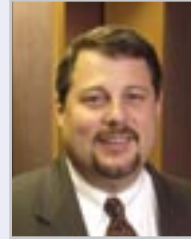


CxO PERSPECTIVE

Out of Sight, Not Out of Mind

By **BRYAN STOLLE**

CEO, President & Chairman, Agile Software



Outsourcing is a key business strategy. The challenge is determining what tasks you should be outsourcing, and how to control those processes once they have gone outside the four walls of your company.

Geoffrey Moore, author of *Crossing the Chasm*, addresses the first challenge with the “Core vs. Context” concept — a company should focus on its core competencies, and outsource context when possible. This approach frees up capital and resources to concentrate on your core value-add around your offerings, and allows you to invest more in the pursuit of innovation.

Context does not refer to unimportant tasks, but rather those tasks which are not directly derived from the value you offer your customers. Context is still part of your business, however. You cannot just hand it to someone else and never have anything else to do with it. Outsourcing means context is out of sight, but not out of mind. If your partners don’t do the job right, your business won’t work. You must pay serious attention to the business processes and systems in place that support your outsourcing partners and allow you to continue to manage the outsourced functions.

The more you can figure out how to integrate your outsourcing partners into your business, the more success they and you will have. Systems such as PLM that provide your partners with visibility into your product record are essential, so they have access to the information and people

they need to get the job done. With access and collaboration, they go beyond the vendor relationship and become part of your team.

Conversely, you also need visibility into the tasks the partners are handling for you. Even though someone else is building your product, for example — and should be able to deliver higher quality and lower cost because this is their specialty — you are still responsible for the customer experience, whether it be delivery time, quality or follow-up service. Your logo is on the product. Whether you designed in a quality problem or the manufacturer built in a quality problem, it is still ultimately your problem. So you need visibility into the processes they are performing,

to make sure they are meeting your requirements, and ultimately your customer’s expectations.

PLM is a foundation that provides this two-way visibility and integrates the context you have outsourced to partners back into your business processes. If you outsource context correctly and have a system in place to manage it correctly, you can be far more effective than a vertically integrated company, where inefficiency is inherently absorbed into the system and cost structure, and capital is wasted.

Outsourcing is an opportunity to examine your business processes, find inefficiencies and unnecessary activities, and instill more rigor, discipline and predictability into the business. Smart companies leverage PLM to take advantage of this opportunity to do more than just “get rid” of a business function or process.

In this issue of *The Product Record*, we focus on outsourcing, with input from experts around the world on the benefits, the challenges, and how PLM can make a difference. ☺



Outsourcing the Whole Package

By SARVESH JAGANNIVAS
Agile Software

Managing Supplier Partners in the CPG Industry

In the highly competitive consumer packaged goods (CPG) market, outsourcing is becoming a key initiative for national brand companies. The simple fact is that brands are losing marketshare in packaged goods as private labels capture more and more of the market worldwide. Moreover, the cost to maintain current market positions and sustain revenues in established product categories is rising for CPG companies.

To counteract these trends, CPG companies are adopting several strategies to gain back some of the market power from large retailers. These strategies include acquiring brands and consolidating companies to secure leadership in specific categories; divesting to focus on core products and categories; extending brands to new regions; and outsourcing non-core and some core capabilities such as manufacturing, packaging, filling, package and artwork design, and even new product idea generation, research and development.

On the other hand, outsourcing has been one of the foundations that has enabled retailers to launch successful private label products and become fiercely competitive in capturing market share and higher margin business. Private labels, which usually have healthier margins than national brands, now represent anywhere from 10 to 50 percent of a retailer's revenue in various geographies, with Western Europe being the most mature in this trend. For example, Boots PLC, the UK-based drug retailer, has as many as six premium "own brands" accounting for greater than 50% of the retailer's annual revenue. Private labels outsource everything from product ideas to manufacturing, packaging and fulfillment, and now the national brands are responding to compete.

Outsourcing is a new line of attack for many national brand companies, which traditionally handled all tasks in-house, and this trend can have a meaningful

impact on the balance of power in the packaged goods market.

Ensuring the Success of Outsourcing

Outsourcing offers significant potential to CPG and private label companies, enabling them to quickly adapt to changing market needs and keep a flexible and low cost structure, but it also poses risks. While outsourced product development and manufacturing processes can increase the throughput of new products, it can also make compliance difficult and potentially slow time to market, for example. Another issue is the loss of control over the intellectual property around products and visibility into product costs. CPG companies could lose detailed understanding of their products and how they are manufactured, while the outsourcing partner could become positioned to develop competitive product clones.

To address these challenges and ultimately succeed with the outsourcing model, CPG companies must first find the right supplier. An important element to the success of this model is finding dependable large partners that offer a full range of services — not just design and manufacturing but also compliance, labeling and packaging. Companies such as Con-Agra and Perrigo are good examples of outsourcing partners that provide full service, from ideas to the shelf, for private label companies.

CPG companies should also implement the following critical success factors into their outsourcing plan:

- A forum for exchange of ideas, product data, and prototype tests with key supplier partners.
- Real-time yet secure collaboration with suppliers at geographically dispersed locations.

- Security for intellectual property.
- Visibility across a portfolio of products from different outsourced partners.
- A centralized repository of product information across product lines and suppliers for easy access by the company.
- A commitment to maintain a high quality of product introductions jointly with partners and manage costs through the extended supply network.

Leveraging PLM in Support of Outsourcing

Product Lifecycle Management, among other critical business processes, is a vital enabler of outsourcing, addressing many of the success factors discussed in the previous section. Most importantly, PLM establishes a centralized repository containing product data and information created by various authoring entities and tools, which is easily accessible by all appropriate parties, including global supplier partners. This level of access allows collaboration between stakeholders distributed throughout different companies, locations and even countries. It facilitates real-time communication with a variety of outsourcing partners including designers, manufacturers, packagers and artwork houses.

The visibility PLM provides across the outsourced product processes also provides the CPG company with greater control over those processes, so they can better manage time-to-market and cost issues, as well as maintain their knowledge about the products and processes. In addition, PLM delivers the broader picture, relating the outsourced products to the entire product portfolio and empowering CPG companies to make the right decisions regarding product and resource investments.

THE HIDDEN COSTS OF OUTSOURCING TO CHINA

BY SHOSHANAH COHEN
& MARK STONICH
PRTM

Why do companies outsource their manufacturing operations to another country? The results of our recent survey of more than 170 companies are not surprising: the most common reason is to save money. With the world's largest low-cost labor force, China is a compelling option.

Does the move of manufacturing operations to China necessarily translate into lower cost? Not always. While labor rates and material costs are easy to quantify, many other costs are not. Unfortunately, many companies only understand the magnitude of these costs after they are already far down the outsourcing path.

On the other hand, PLM can provide access control and attribute-level security to protect corporate information and intellectual property around products.

The role of PLM has been proven through the outsourced design and manufacturing models of other vertical markets such as high tech, where companies such as Dell and Lucent have risen to positions of industry leadership by leveraging PLM in support of outsourcing. Now is the time for CPG companies to take their turn and actively promote their outsourcing agendas with the help of PLM technology. ☺

As Director of Marketing, Sarvesh Jagannivas guides the strategy and direction for vertical markets at Agile Software. Mr. Jagannivas, previously a management consultant at Bain & Company and with 16 years of professional experience, currently directs Consumer Products Industry Marketing and Business Development.

INHERENT DIFFICULTIES WITH CHINA PARTNERSHIP

A China partnership can have several difficulties. First, the language barriers with mid- and lower-level management can be challenging. Many workers in China come from rural areas and have less formal education, making communication a major challenge.

Many Chinese companies also have limited experience with capitalism and industry-standard supply chain management processes, resulting in long learning curves and increased time to implement new supply chain and operations processes.

The lack of experience and expertise can be compounded by cultural barriers. The typical Chinese company is hierarchical, with tremendous emphasis placed on titles and reporting relationships. Decisions are made by executives and managers, and lower-level employees do not question inefficiencies.

Finally, China's manufacturing capacity has expanded at an extremely rapid rate. The supply of skilled employees has not been able to keep pace.

It is easy to misjudge the effect these challenges will have on product release cycles, production planning, and ongoing communications. As a result, the time commitment and cost of traveling to conduct live working sessions with an outsource partner is often underestimated. Heavy travel may be required for months or even years.

Many companies also fail to consider the incremental costs associated with a manufacturing operation in an area of the world far removed from the end customer. The physical distance between the manufacturing location and the customer results in high transportation and expedite costs, reduced supply chain flexibility, low inventory turns, high inventory obsolescence, and poor delivery performance.

WHY GO TO CHINA?

With all of these potential hazards, why do so many companies outsource to China? Because the promise of low labor and material costs is very real. But companies need to pay attention to the less obvious costs of outsourcing. We recommend the following:

Make sure the products you plan to outsource are suited to manufacturing in China. Mature products that do not require leading-edge manufacturing capabilities are the most likely to result in near-term cost savings if moved to China.

Ensure that you have the internal resources to manage a high-touch relationship. You need a sufficient number of supply chain personnel with experience managing the transition to a Chinese manufacturing partner.

Develop supply chain management best practices with your outsource partner. Your local manufacturing work instructions may be incomprehensible to your new partner. Variations in equipment, techniques, and skill sets may require that the entire manufacturing process be re-evaluated for China.

Don't rely on your prospective partner's sales pitch to determine its level of expertise. Understand the capabilities of the specific site you will be working with, and forget about any showcase facilities you toured. ☺

Shoshanah Cohen is a Director and Mark Stonich is a Principal in PRTM's worldwide supply chain practice. Both have published extensively on various topics related to supply chain management. Shoshanah is co-author of Strategic Supply Chain Management: The Five Core Disciplines for Top Performance (McGraw-Hill, 2004). The authors can be contacted at scohen@prtm.com and mstonich@prtm.com.

Running with the Big Dogs

Startups Get Competitive by Outsourcing

BY PAUL PECK

Covaro Networks

When I was running manufacturing for a Fortune 500 company, I never had the right amount of manufacturing where I needed it when I needed it. I always had too much or too little, and either one costs money. Many industries have come to the conclusion that it is better to have someone else handle your manufacturing — someone with a large portfolio of global resources. Even though they charge you for the service, it saves you more by being the right size of factory at the right time.

Borrowing World-Class Manufacturing

Now that I work for a startup, I don't want to own a factory. I just want to borrow it for a while. I don't know exactly when and where I will need it. But if I outsource manufacturing, I can turn it off and on as required. That's the real beauty of outsourcing — you only buy as much factory as you need.

The large telecom companies almost exclusively outsource manufacturing today to multibillion dollar global manufacturers. As a startup, I can tell my customers that my products are made in the same factory with the same expertise as the industry leaders. This allows me to run with the big dogs.

The new era of outsourcing opens up opportunities for a startup to be more competitive than in the past. Now the

tinest fledgling startups can use these manufacturing resources and compete with large global companies.

Collaborating Globally via PLM

PLM technology has also enabled startups to take advantage of outsourcing and be more competitive. With tools like Agile's PLM solution, it is easier than ever to outsource manufacturing successfully.

Startups need to be able to comprehensively describe their products in all the detail necessary for these electronic manufacturing services to know how to build them. It becomes more important than ever to have a complete electronic revision-controlled description of the product available on a global basis.

Using PLM, I can orchestrate global manufacturing resources while sitting here in Texas with a tiny operations department of three people. Indeed, the engineers can no longer walk down to the floor, go see Joe in the machine shop, and take a red pencil to his drawing. And it is probably better that isn't possible. Instead, if the engineer wants to make a change, they have to go through a rigorous change control process established in our PLM system to our specifications.

Furthermore, to make changes, we don't all have to be physically in the same conference room at the same time. We can now be dispersed physically, across time zones, on the

road — and we can all collaborate and sign off on changes through our PLM solution. Now suppliers collaborate as well — which was not even practical before. Our people, as well as contract manufacturers down the road and component vendors in China, can all participate much more freely, so we get a better decision more quickly and with more clarity.

Collaboration was always important. But now collaboration transcends organizational boundaries, time zones and language barriers. Instead of work orders, I issue purchase orders. But even though we have spread our factories outside our company and around the globe, with Agile PLM we have better collaboration and I feel more in touch with my suppliers in China than when I was up on the top floor of the building and manufacturing was just downstairs on the production floor. ☺

Paul Peck, Vice President of Operations for Covaro Networks, has 25 years of diverse telecom industry experience. Prior to Covaro, he was Vice President of Operations at Navini Networks, where he was responsible for the manufacturing and field operations divisions. Peck also served as Vice President of Operations for Monterey Networks, and, after its acquisition by Cisco Systems, he continued to serve in a wide range of operations and product launch roles. Peck has also held management positions at Alcatel USA following its acquisition of DSC Communications, Xerox Computer Services, Northern Telecom and Texas Instruments.





MADE IN TAIWAN

Examining Taiwan's Leadership in ODM Outsourcing

CONTINUED FROM PAGE 1

A broad range of products are being outsourced to Taiwan these days. The hottest technologies include notebook computers, semiconductors, and wireless handheld convergence products such as mobile phones and PDAs. Previously, Taiwanese companies manufactured a wide range of products, but now we are seeing more specialization in various areas such as computers, telecom and handhelds. This way companies can concentrate on their core capabilities, differentiating themselves in the market and increasing the value of outsourcing.

Can Taiwan retain the role as ODM leader? The challenge for Taiwanese companies is to continue to be the most competitive ODM players in the market. Successful Taiwanese ODMs are leveraging the benefits of setting up operations in China or other low-cost regions to capitalize on low-cost wages, R&D capabilities, and the overall network of supply sources. The strength of international logistic operation services are also leveraged by the main players.

IAC's strategy is to maintain value through innovation. We are establishing two business models — IODM (Integrated Original Design Manufacturing) and COBM (Community Own Brand Marketing), as well as building a process-oriented customer service organization and supporting continuous learning and growth.

Regarding strategy execution, IAC has deployed the CSP cycle methodology to review and recognize the core competences of IAC, and to leverage strategy map and BSC (balance score card) tools to execute the strategy and measure performance. Based on the performance results, the plan will be continuously modified.

As a critical component of this strategy, PLM enables us to provide a common collaboration platform to our product development teams in both Taiwan and China, to aggregate all our product development information which we expect to enhance the efficiency of TTM (time to market), TTQ (time to quality) and TTV (time to value) for

both IODM and COBM business models.

As for the future, I see Taiwanese ODMs such as IAC continuing to move in the direction of design and even more towards innovation, ultimately offering high quality original designs. The ODMs are not here to replace the OEMs. We are here to help them become more competitive by providing faster, lower cost alternatives for design and manufacturing. They are our partners, and our goal is to achieve a mutual success. We want to be able to offer them a broad selection of services from original design through manufacturing so they can choose what services are most advantageous to them for each particular product, further strengthening their own overall product portfolio. ☺

Grace Guo is Senior Manager of Information System & Technology for Taiwan-based Inventec Appliances Corp. and served as project manager for the Agile PLM implementation.

the product record

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plm in motion

MAGNA STEYR Manages Outsourcing with Cimmetry's AutoVue

With outsourcing, tasks may go out the door, but more documents come back in. Managing documents from vendors performing outsourced work is critical to communicating, collaborating, managing the relationship and guaranteeing they will meet your expectations. Collaborative visualization is an important component of PLM that is essential to managing product data in diverse formats, and collaborating with a broad set of users inside and outside the company.

For this reason MAGNA STEYR's plant layout department in Graz, Austria, is using AutoVue visualization and collaboration software from Cimmetry, an Agile company, as a visual front end for their planning database. MAGNA STEYR — a subsidiary of Magna International, one of the world's most important automotive suppliers — builds

cars for manufacturers like BMW, DaimlerChrysler and GM. Enormous requirements are placed on plant layout when an entire vehicle is to be produced. It is essential that the required infrastructure is in place in time for the start of production.

Since MAGNA STEYR outsources much of the plant layout work, production engineers need to coordinate with a multitude of vendors. This includes managing a deluge of various external documents in a variety of different formats. The plant layout department has expanded their existing CAD database so they can store and manage all the planning documents, and better control the outsourcing process — and AutoVue is the heart of this solution.

AutoVue is used to view documents when checking them into or retrieving them from the database. When a user clicks on a link in the document list,



the viewer is automatically started.

"I can use the viewer from any computer," said Peter Nagy, head of CAD Systems for the plant layout department. "This is an inestimable advantage from the point of view of integrating colleagues at other sites." Because AutoVue delivers easy access via a web browser, MAGNA STEYR can use the system to collaborate with external users, such as vendors.

MAGNA STEYR has gained the following benefits from AutoVue:

- Organized flow of information coming from vendors.
- Time spent managing both internal and external documents decreased by 10-15%.
- Reduced errors and duplicated work. ☺

ESI Reaches Out to Partner Across the Globe with Agile PLM

ESI (Estech Systems, Inc.), a designer, manufacturer and marketer of advanced, highly featured business communication systems, is currently implementing Agile PLM to streamline its critical outsourcing relationship with a contract manufacturing partner operating in Malaysia and Taiwan.

"Even though we are a relatively small company, we are competing against companies with a global presence," explained Tim Pickens, Vice President of Manufacturing for ESI. "We have to compete on technology, price, quality and delivery in a global marketplace. Outsourcing manufacturing helps us manage our costs and focus on what we do best, which is designing products, while our partner does what they do best, building the product."

Previously, sharing information with a manufacturing partner on the other side of the globe without using PLM was a cumbersome process involving email, FTP and faxing.

By implementing Agile PLM, ESI will guarantee that all stakeholders worldwide have instant access to a uniform product record.

"It has become more and more difficult to communicate across all the different internal and external organizations to ensure projects stay on schedule and meet cost and performance goals," Pickens said. "We have been successful but it hasn't been easy, and as we continue to grow it would be almost impossible unless we have a system in place to help us manage the product record across all our supply chain partners, and share that information with the people that need it."

"Our Asian partners are 13 hours out of sync with us," he continued. "When they are working, we are sleeping, but they still need to access drawings and documents that help them produce our product. Before using PLM, we lost a lot of time just trying to coordinate

the flow of information and making sure everyone had what they need to do their job. With PLM, we give them the same visibility into the product record that we have, managed with security and access control."

With the new system, the offshore partner becomes a participant in the process, collaborating on a real-time basis rather than simply observing. If they have suggestions or changes, they can communicate those ideas via the PLM system. They simply dial into the system and access the data they need.

"We are trying to position ourselves to be competitive in a global marketplace against corporations that have much greater resources than we do," he added. "By using PLM to efficiently collaborate with our partners and leverage their strengths, we can focus on what we do best and deliver a globally competitive product." ☺