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VALUE STREAM MAPPING AT SYSINTEG (A)

Sid Parker, a summer intern at XS Inc. (XS), had gotten up early to drive to the SysInteg plant to participate in a two-day Value Stream Mapping (VSM) event that was getting under way that morning. This was his first chance to put his knowledge of lean principles and tools into practice working with a key supplier. Parker had spent the last month organizing and analyzing supplier VSM events—a new initiative for his Corporate Supplier Development department. Today's event was a hands-on opportunity to contribute directly, and he was very excited. His internship manager had obtained special permission from SysInteg for Parker to participate in the otherwise closed-door VSM event.

Parker had been interested in pursuing a post-MBA career in operations strategy, and his internship search had led him to an exciting lean-implementation opportunity at XS, a Fortune 100 manufacturing company, where he would have a bird's-eye view of every division's supply-chain-management improvement activities. Jim Lesley, Parker's manager at Corporate Supplier Development, was a recent graduate of the same MBA program and took a keen interest in Parker's development, assigning him to projects that required both analytical skills and sound judgment.

The Manufacturing Extension Partnership (MEP), a nonprofit organization funded by the federal government, had contacted Parker's department to explore a lead-time-reduction program specifically targeted toward improving supplier performance. MEP approached large Original Equipment Manufacturers (OEMs) to select key suppliers and then helped to arrange VSM events at supplier facilities where the organization's lean consultants would help supplier personnel identify waste and reduce lead-time in manufacturing and distribution processes. The OEMs were interested as the projects could help create a cost-effective supply chain in the longer term. And suppliers saw the MEP program as an economical opportunity to access expert advice that could not only help improve operations but also strengthen their current status with the OEMs. So, the MEP model promised a win-win situation for all involved.

This case was prepared by Chitanya Karri (MBA '08) and Robert D. Landel, the Henry E. McWane Professor of Business Administration. It was written as a basis for class discussion rather than to illustrate effective or ineffective handling of an administrative situation. All names and data in this case have been disguised.

Parker's responsibilities included creating a structured program, organizing and managing kick-off events, developing a stage-gate review process, identifying internal stakeholders, organizing and overseeing the progress of the VSM events, conducting feedback surveys, and coordinating with various stakeholders from XS divisions, MEP, and the suppliers. His assignment also required that he create and document a business process to help with the execution of future MEP-supplier events.

As this was XS's first time sponsoring an improvement initiative led by a third party, it was under tight scrutiny by the XS corporate-level senior management. On the one hand, XS saw this as an opportunity to deploy external lean experts from MEP (in lieu of the internal XS resources, who were often operating with a large backlog of internal projects), while on the other hand, some members of senior management were skeptical about the lack of oversight on milestones, performance management, or (supplier) resource allocation. Parker and Lesley considered anything less than 50% reduction in cycle time as a project failure; Parker was concerned that a poor performance at SysInteg would affect his chances for future employment at XS. After today's event at SysInteg, Lesley expected Parker to establish a communication plan and identify stakeholders for each future VSM event.

XS Incorporated

XS was the industry leader in practically all the product segments in which it competed. The company held a strong position in its relations with suppliers and also with customers. It had typically emphasized delivery consistency from its suppliers and leveraged its ability to purchase for different divisions as an advantage in all negotiations. Aware of its reputation as a fair and tough negotiator, XS tried to compliment this image through a variety of programs designed to help its key suppliers improve their operations. The programs included supplier diversity, health and safety, green projects, and such supplier-development initiatives as the lead-time-reduction efforts now underway with MEP. Corporate Supplier Development was responsible, among other things, for tracking supplier performance on various metrics, such as cost, quality, and delivery performance.

System Integrators (SysInteg)

As a reliable supplier, SysInteg was known for its superior quality, delivery reliability, and customer satisfaction. To maintain its competitive advantage, it focused on providing low-cost, procurement and logistical services to its customers. Its history of productivity improvement made it an ideal choice for a MEP event. SysInteg's core competencies were its logistics-system capabilities that had evolved over the last six decades.

Procurement

- Third-party procurement
- Online order-status check

Logistics

- Inspection services
- Parts kitting
- On-site Supplier Managed Inventory (SMI)

Besides XS, SysInteg provided custom-procurement and logistics services for close to 900 OEM clients. The XS annual-procurement contracts specified that SysInteg purchase XS-designed components from third-party certified suppliers, conduct incoming inspection, maintain a secure inventory, and package and ship orders to an XS-division factory according to a pull-based production schedule. SysInteg's contracts with XS typically required an average 90-day inventory for each contracted SKU. This allowed XS to run its production facilities with low on-site inventories and avoid costly production delays because of stock-out conditions. For the past four years, changing production forecasts combined with limited on-site inventory space often had forced XS divisions to contract SysInteg for numerous different specialty parts.

Procurement specialists at SysInteg studied XS order patterns and projected future orders to avoid overstocking and, in turn, reduced carrying costs. Accordingly, it placed orders with parts manufacturers to meet its forecast, carry a lean inventory (less than the expected 90 days), and still provide on-time delivery to XS facilities. This arrangement benefitted XS, as the cost for the procurement and logistical services at SysInteg was, on average, 10% less than the annual disruption costs associated with stock-outs that XS faced when volatile production schedules combined with the daily fire fighting related to late shipments from suppliers occurred.

Manufacturing Extension Partnership

For almost two decades, MEP had focused on increasing the competitiveness of the U.S. industrial base by bridging the productivity gap for manufacturers, identifying opportunities for growth, and encouraging technology deployment.

MEP provided its manufacturing customers with a wide array of fundamental services in business and process improvements, helping them to stay strong and ready to compete in the global market. Grown from a pilot project that consisted of three centers to national coverage through its 59 affiliated organizations, MEP's range of services provided by these organizations and its partners was also growing in the following areas:

- Programs in lean manufacturing were expanding to consider the entire enterprise;
- Energy and environmental services had grown to include sustainability;
- Information technology now addressed continuity-of-service issues; and
- Future programs would address manufacturers' concerns related to innovation, technology deployment, and business growth.

These and other disciplines added the vital skills and capacity to client companies that enabled them to achieve measurable results.

By 2007, MEP and its partners provided manufacturers the services it had developed over the years, while adding new offerings in growth services and technology adoption. The nation's manufacturers, with MEP assistance, had streamlined their plant operations and improved their bottom lines, and as a result, MEP with its partners, was poised to capitalize on these results by creating opportunities for growth via new sales, new markets, and new products.

Lead-Time-Reduction Program

The Corporate Supplier Development department at XS had 10 internal lean experts who traveled between different internal supplier sites to conduct training sessions and facilitate Kaizen/Value Stream Mapping events. These events usually ran from two to five days, and divisional participants gave them high ratings. Because of the increasing popularity of the events and the fixed number of experts, the average waiting time for a new VSM project was usually three months.

MEP's goal was to identify suppliers across the United States and help them improve their operations. In particular, MEP aimed to reduce Manufacturing Critical-Path Time (MCT)[1] for an identified product line. In doing so, MEP introduced the supplier to lean thinking and demonstrated the value and simplicity of the tools and processes to start a supplier on its own lean lead-time-reduction journey. Ideally, the result was that a supplier became more capable in competing with low-cost, non-U.S. suppliers. And because the government subsidized the MEP programs, suppliers were not required to pay for a two-day VSM event. A supplier could choose between contracting MEP to implement the recommendations of the VSM event or to go it alone. Depending on the complexity of the recommendations and the supplier's experience with MEP during the VSM event, the supplier decided whether it wanted to contract MEP for the implementation. The MEP charged a nominal fee for this phase, and there were state-provided subsidies that paid part of this fee.

[1] MCT was defined as the time taken within the supplier facility once it received the raw material to the point when the finished product left the facility. This did not include customer lead times but only the production time in the supplier facility.

Thus, MEP brought in experts at a subsidized cost, providing XS with an opportunity to immediately run new supplier development programs that would otherwise have had to wait many months. In addition, MEP was a neutral third party and could allow suppliers to talk freely about performance issues they were hesitant to share with XS. Each supplier committed to a three-phase process: Phase I, Phase II, and Phase III. XS also organized a kickoff event where it, suppliers, and the MEP reviewed the project goals and signed the Contract and the Charter. (**Exhibits 1** and **2**).

Corporate Supplier Development allowed the divisions to identify key suppliers based on any criteria the divisions deemed appropriate. This lack of constraints helped the divisions in their identifications, and they collectively identified 20 key suppliers.

Each supplier representative then received information about the benefits of MEP and XS's involvement. An interested supplier was provided with a personalized contract and a charter listing the scope of the project as outlined by MEP and XS. The supplier then was required to identify a waste-laden process in an area of its facility that supplied an XS division.

First Day

VSM training

As Parker walked into the SysInteg conference room, he noticed that the participants had just finished breakfast and were waiting for the MEP expert to start the meeting (**Exhibit 3**). Parker looked at the participant list and was relieved to see that the participants were people with the authority to make process changes. He had read in the VSM training manual that it was necessary that the participant group consist of higher-ups; otherwise, recommendations created at the meeting ran the risk of being forgotten afterward.

Parker noticed two chalkboards occupied the adjacent walls of the room and that there was an overhead projector. He later noted that one of the boards was used to list concepts that the instructor considered important. The instructor used the other board to draw the Current State using post-it stickers. The projector displayed the electronic version of the maps drawn at the session.

Ron Larson, the lean expert from MEP, started the session by reemphasizing the objectives of the session, and he handed out a copy of the *Value Stream Mapping Workshop—Participant Guide* to each participant. This handbook provided a systematic approach to understanding such lean terms as muda, kanban, takt time, etc., which Parker considered a good review of his former operations elective course in lean thinking. Larson led the group through the basics of Value Stream Mapping broken up into two sections: Current State and Future State mapping. Larson explained that Current State was best drawn using the following guidelines:

1. Walk the gemba (workplace).
2. Use pencil and paper to record observations and process steps when walking around.
3. Start with the customer in mind.

Parker soon realized that the focus of the event was on a single XS part number and that the operations observed were typical of the logistics services provided for XS divisions and other OEM customers. This defined the operational scope of the VSM event.

The Situation

Regina Puzzo, vice president of Operations at SysInteg, and Richard Blair, director of Operations at SysInteg, were actively involved in the training session and appeared interested in achieving reduction in internal operations lead-time. Puzzo and Blair had identified the spacer-disk pack as the focus at this event, as the item represented the hundreds of SKU's covered in XS/SysInteg contracts. The spacer-disk pack consisted of 10 individual but identical disks that were considered finished products, requiring neither kitting nor assembly at SysInteg but were used in both subassembly and final assembly operations at various XS facilities for many different power-transmission applications in several product families (**Exhibit 4**). XS required that each spacer-disk be inspected for the latest parts-drawing specifications and then wrapped and stored individually. Prior to the arrangements with SysInteg, XS had sourced this line of spacer-disks directly from the manufacturer, DP Specialty Suppliers (DP). But erratic production schedules at XS operations, and reduced inventory storage area, combined with frequent missed shipments and high inventory carrying costs prompted XS to contract for SysInteg's logistic services. XS had attempted to improve its ordering practices and reduce its stock-out costs; yet it had made little progress.

XS required all of its suppliers to perform a Quality Check (QC) on all parts delivered to its facilities. Consequently, SysInteg was required to inspect all of the parts sourced from DP Suppliers using design specifications provided by XS. Puzzo concluded that almost 60% of XS-contracted parts failed at least one of the verification or inspection steps and required a follow-up inspection from either DP or XS. Then Puzzo commented that her team had suggestions on how to grow the yield to a respectable number.

Walking the Plant

Walking through the plant, Ron Larson and the many of the participants raised questions about details regarding the work-flow process. Puzzo fielded the questions and provided only the necessary details, taking care not to complicate the situation. Parker took notes to describe each step and carefully documented anything that seemed important in determining if a step was useful or not for the future state (**Exhibit 5**). He knew that these notes would come in handy in the VSM current state- and future state-mapping activities. The group started with the receiving

dock and worked its way through the shelves and inspection-process activities, finally stopping at the point when the part had left the facility.

Current State Mapping

The *Value Stream Mapping Workshop—Participant Guide* listed the following Team Tips that proved very useful for participants in mapping the Current State:

- Review the basic processing steps and calculate the takt time in your team's breakout room.
- Draw while on the shop floor.
- Draw both the material and information flows.
- Introduce yourself to operators and show you are drawing the total factory flow as part of a training session; show them your drawings.
- Select a scribe and combine drawings into one Current State map (in team area).
- Calculate total lead-time versus processing time.
- Make an overhead transparency of the map and select presenters.
- All team members go up front with presenters. State the product family and takt.
- Present from your overhead transparency (five minutes per participant).
- Start with customer and information flow into the facility.
- State the lead-time versus the processing time.
- Remember what problems you saw and where you found push and overproduction.
- Share any future-state thoughts you have so far.

Back in the conference room, the participants' team reviewed its notes and discussed its observations before breaking for lunch. Larson announced that each participant should spend about an hour after lunch preparing their own individual Current State maps before he called everyone together to draw a Current State map on the board. Everyone would have to agree on a particular step/process before proceeding to the next one to ensure that the final map was one that participants regarded as a good representation of the process in question. Then, the steps would be put into three categories: Value Added (VA), Non-Value Added (NVA), and *necessary* Non-Value Added (nNVA). Larson indicated that this was the first step in improving the process and visualizing a Future State.

Calculating Value-Added and Non-Value-Added Time

- *Value Added (VA)*: Time spent on processes that the customer specified and paid for, such as a quality check. Any action changing a product in context with providing value to the customer was Value-Added.
- *Non-Value Added (NVA)*: Time spent in such activities as waiting for materials, travel to supplier, etc., which did not add value to the product or service for which the customer had paid extra. Any action that consumed labor or material resources that did not provide value to the customer, such as unnecessary inspections, setting up a workstation, looking for tools, and fixing a broken gauge was Non-Value Added.
- *necessary Non-Value Added (nNVA)*: Time spent on unavoidable activities such as delivery lead-time. Any action that needed doing in order to process the order, such as generating workflow instructions, calibrating measurement tools, or preventative maintenance was *necessary* Non-Value Added.

Larson explained that the sum of VA, NVA, and nNVA was the Manufacturing Critical-Path Time (MCT)—the primary metric for this exercise. The Current State Map would be amended to include the calculations after identifying VA, NVA, and nNVA.

Parker noted that takt time was not relevant for this exercise as there was some disparity about the number of orders at the supplier's end. Although Richard Blair said that customer orders were around 2,800 a year, he did not want to focus on leveling the flow to the takt time but on taking the existing waste out first.

Ron Larson emphasized that the VSM thinking rather than focusing on achieving exact results should focus on identifying the approximate amount of waste in a reasonable manner. Therefore, he told Blair and Puzzo that it was acceptable if the Current State map was an approximation because the incremental time spent finding missing data was not worth waiting for.

Note: The spacer-disks were not modified at SysInteg, as no subassembly operations were performed, which made it challenging to distinguish between Value Added time and Non-Value-Added time for this particular VSM.

Second Day

Future State mapping

After walking the gemba, although Parker recognized obvious waste in the Current State map, he thought he saw areas of improvement. He liked the idea of not working on the Future State map on the same day as the Current State map to allow participants enough time to reflect on the previous day's activities. The program goal was to achieve a minimum of 50%

improvement in this metric from Current State to Future State. As Parker reflected on the events of the previous day, he realized that the Future State needed to be a realistic representation of possible improvements to the process. He wondered if SysInteg and XS had the same idea of what was realistic and whether MEP actually had motivated the participants to create a Future State map they had agreed upon that was easily implementable. Parker prepared himself for another good learning experience.

Exhibit 1

VALUE STREAM MAPPING AT SYSINTEG (A)

XS Supplier Development Contract with MEP

Project Goals:

- To provide Manufacturing Critical Path Time (MCT) reductions
- To accelerate the adoption of lean manufacturing practices by XS suppliers
- To foster a strong working partnership between MEP, XS Operations, and the supply base

Project Deliverables:

- The VSM event is to be held at the supplier's facility and facilitated by MEP or a locally trained and qualified MEP organization using the Accelerate Model.

1. **XS responsibilities:**
   a) Identify a Project Champion for this effort, who will commit up to 20% of his/her time in project management.
   b) Fund MEP Project Management fee @ $2000* per supplier
2. **MEP responsibilities:**
   a) The Phase I includes a gap analysis of the product or part family agreed to by XS and each supplier in the Charter signed at the kickoff meeting. MEP will have a pre-project meeting with the supplier to verify the value stream, discuss potential project impact and barriers. A two-day/two-person on-site facilitation of the Value Stream map with MCT gap analysis, for the supplier's team to be provided. Following the two-day VSM event, a post-project meeting to review results by the MEP.

** Amounts and numbers modified for case purposes.*

Source: Created by VSM participants.

Exhibit 2

VALUE STREAM MAPPING AT SYSINTEG (A)

Charter

1. **Business Case:**

   SYSINTEG is a key supplier to XS. In order to remain competitive, both **XS** and **SYSINTEG** must focus on ongoing continuous improvement. The implementation of lean manufacturing Principles to reduce and eliminate waste for all areas of **SYSINTEG** business can play a critical role in achieving this objective.

2. **Goal:**

   The goal of this project will be to increase **SYSINTEG** order-fulfillment performance through an improvement in Manufacturing Critical-Path Time. MCT reduction results in improved operational effectiveness and increased order fulfillment flexibility. Consequently, the overall *project goals will be to implement action items identified to reduce MCT by 50%.*

3. **Project Scope:**

   The project will focus on the following: *(Part #/name)*

4. **Schedule & Deliverables:**

Activity	End Date
Finalize/Sign Project Charter	**MMDDYY**
Phase I • Collect data • Define o Current State: VSM and MCT o Future State: VSM and MCT o Identify gap between Current and Future State o Develop Gap Closure Plan o **SYSINTEG** presents results to XS	**MMDDYY**
Phase II • Implement Gap Closure Plan • Confirm results with VSM and MCT • **SYSINTEG** presents results to XS	**MMDDYY**
Phase III • **SYSINTEG** to conduct ongoing continuous improvement through repetition of Phase I/Phase II on other part numbers, part family(s), and value stream (s). • **SYSINTEG** to sustain a culture of lean and continuous improvement.	**(Ongoing)**

Exhibit 2 (continued)

5. **Assignments and Roles:**
   a. XS Division Sponsor:
   b. SYSINTEG Executive
   c. MEP Lean Expert
6. **Savings:**
   a. Existing cost reduction plans and commitments will continue to apply.
7. **Resource Support:**
   a. **SYSINTEG** will assign a Project Manager who will have overall project responsibility.
   b. It is not anticipated that **SYSINTEG** will require significant capital investment in order to achieve the objectives of this project.
8. **Communication Plan:**
   a. Project Status Reports will be generated by **SYSINTEG**'s Project Manager and distributed on a regular basis to a commonly agreed upon distribution list.

Source: Created by VSM participants.

Exhibit 3

VALUE STREAM MAPPING AT SYSINTEG (A)

VSM Event Participants

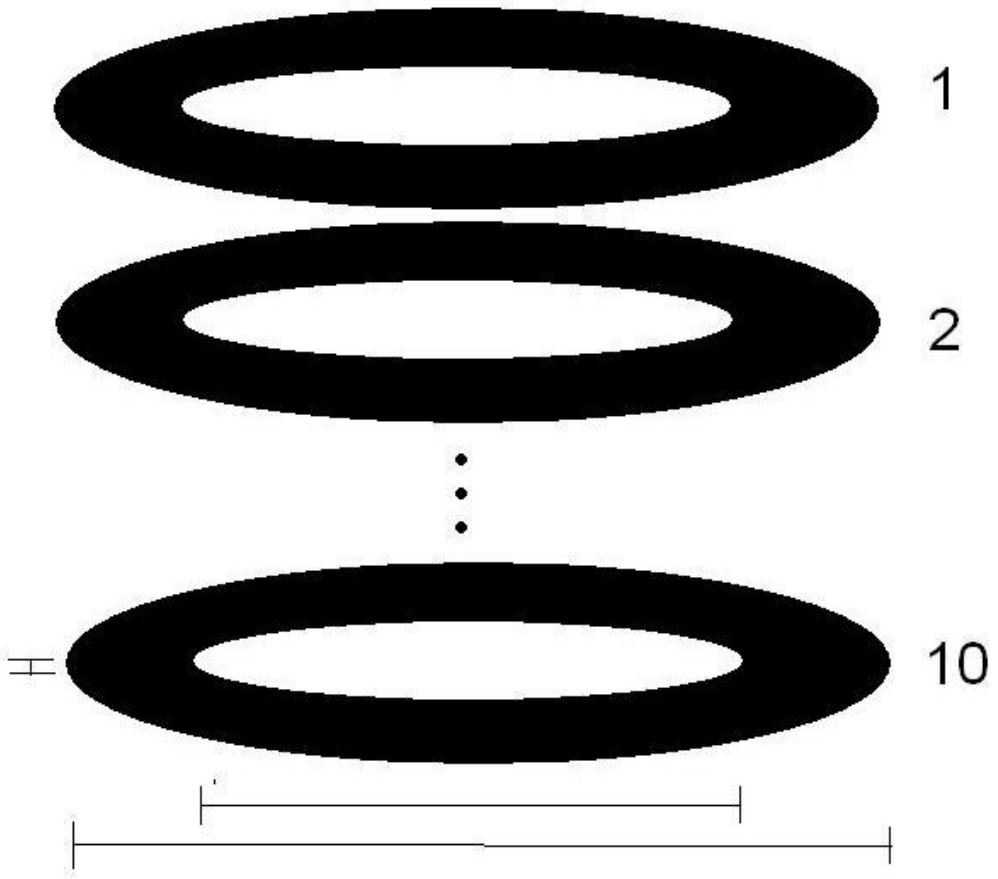
Name	Company	Title	Details
Mark Maple	XS-division	Senior Operations Manager	Sees the event primarily as a cost-cutting exercise.
Brett Turnip	XS-division	Operations Analyst	Reports to Mark Maple. Open to new ideas and learning new tools.
Johnny Gordon	XS-corporate	Manager	Environment Safety Expert. His participation is limited to observation only.
Sid Parker	XS-corporate	Summer Intern	New to VSM methodologies. Trained in various lean techniques at graduate school and in workshops at XS.
Richard Puzzo	SysInteg	Director Operations	Knowledgeable and committed to the project success. Not entirely convinced by the VSM approach and seemed skeptical of any too-good-to-be-true suggestions.
Regina Blair	SysInteg	VP Operations	Very personable and involved. She relied on Puzzo's inputs in her absence from the sessions. She was keenly interested in the progress and not the details.
Ron Larson	MEP-corporate	Lean Expert	Lead facilitators. Larson and King led the entire group during the VSM training session, the walk through the warehouse and helped the group prepare the Current and Future State maps. They were also responsible for providing a debrief report to SysInteg and/or XS).
Bob King	MEP-local chapter	Lean Expert	
Artie Marshall	MEP-corporate	VSM Software Specialist	Skilled at MPT mapping software (based on eVSM platform). Spoke only when he could not understand the group's hand-drawn diagram.

* XS, SysInteg and all participant names, roles, and personality descriptions are fictitious.

Exhibit 4

VALUE STREAM MAPPING AT SYSINTEG (A)

Spacer-Disk Pack



Note:

1. Each spacer-disk pack contains 10 individual spacer-disks sealed in a plastic bag. The disks may vary in size depending on the kind of assembly that requires them.
2. Every pack is opened and visually and dimensionally inspected based on XS-supplied part drawings.
3. Inner and outer diameter, thickness, material-surface finish, and flatness attributes are some of the inspection measurements that are checked against the XS drawing-specification limits.

Source: Created by VSM participants.

Exhibit 5

VALUE STREAM MAPPING AT SYSINTEG (A)

Process Observations by VSM Participants

Step	Process Name	Process Description
1.	Receive, open and sort	DP Specialty Suppliers typically shipped a dozen or so different manufactured products weekly in large cartons to SysInteg, so it was necessary to open the shipping cartons at the receiving dock to sort the contents by part number/SKU. Spacer-disk pack receipts had to be checked by "matching" the part number and the item quantities against information on a SysInteg purchase order. Each plastic bagged "spacer disk pack" contained 10 identical spacer disks. Finally, the operator looked up the assigned inventory storage location in the receiving area for the spacer disk packs and the items were moved to the location. DP's cartons usually remained at the SysInteg receiving dock for a day before this step was begun.
2.	Schedule and pick for inspection	The spacer-disk pack items remained in the assigned storage rack location until an internal release order triggered pick and inspection activity. This step indicated that a quantity of the spacer disk packs was to be picked and transported to an assigned inspection station. Blair indicated that on average the disk packs remained in the receiving area storage for 45 days before they were scheduled for inspection. He admitted that it was longer than they wanted to take on average but urgent* items would get higher priority. *Urgent usually meant expediting activities because of customer phone calls expressing requirements for special services.
3.	First article inspection reporting	Blair noted that per the AS9100 policy guidance (noted below) and contractual agreement with XS, a thorough check is made on a sample of all newly designed parts or redesigned parts to compare the first production lot of delivered items against the XS drawing specifications for the part. This was standard checklist of questions to find out whether the DP Specialty Suppliers fully understood the documented specifications and whether the supplier had provided appropriate evidence of the process capability statistics. This inspection step had a very high pass rate. Parker noted that this step took 90 minutes but he was unable to understand the significance of this step, as the spacer-disk parts had not been modified in several years. He made a note to question this at the mapping session. 4.10.6 of AS9100/EN9100 states, "*First Article Inspection: The supplier's system shall provide a process, as appropriate, for the inspection, verification, and documentation of the first production article.*"
4.	Dimensional inspection	This step was required to check if each of the dimensions of the spacer disk part was within acceptable dimensional specifications range as set forth by the engineering drawing. Some VSM members commented that while this quality check makes sense if the disk was used in an operation within SysInteg, but only provided logistics services, this step seemed redundant; DP Specialty Suppliers had previously been a certified supplier to XS delivering spacer disks packs directly to an assembly line operations without incoming inspection—a JIT supplier.
5.	Travel to supplier and inspection	According to Blair, SysInteg personnel travel became necessary only when inspection issues could not be resolved with DP over phone. He said, "Sometimes a large number of disks would not match the design specifications and despite several attempts, they would be unsuccessful in contacting the DP or come to a resolution agreement over phone." Blair added that such problems also arose when an incorrect product or incorrect quantity was shipped. In such an event, SysInteg would send a representative to the DP facility to sort out the issue, but this activity was something that SysInteg wanted to avoid in the future.

Exhibit 5 (continued)

6.	Review process certification	SysInteg reviewed process certifications information from DP. In this step, SysInteg was required to check if the manufacturing processes at DP conformed to the Process Certification Standards set forth by XS for all purchased components (process control charts, materials certifications, capability index documentation, drawing revision information). Puzzo mentioned one particular troublesome issue: design specifications revisions made by XS and sent to SysInteg were often out of version as compared to the specifications that DP Specialty Suppliers had used for its manufacturing. This would also occur when there was an engineering deviation that was communicated to DP without including SysInteg. SysInteg usually ended up rejecting the product and holding it for disposition, as the process certification documentation provided by DP would not match the one provided by XS.
7.	Accepted by quality	An "approved by quality" stamp put on the accepted spacer disk product and kept at the inventory storage area (approved inventory ready for shipping-supermarket).
8.	Pick	Spacer disks picked up from the supermarket inventory based on XS's order schedule. This step was important as it ensured that the order was picked on time.
9.	Source inspection	This step requires a Certified Quality Assurance Representative (CQAR) from XS to inspect the spacer disk product at the SysInteg facility SysInteg usually had a wait time before the CQAR traveled to their facility and performed the source inspection.
10.	XSQS	Stood for XS Supplier Quality System—A system to track PPM defects, and request information regarding nonconforming product for each of the XS suppliers. Deviations were required to be submitted to XS once the Source Inspection was over.
11.	Contact vendor for correction	SysInteg used XS's Web-based helpline system or called up XS' tech-support line to resolve open issues that usually dealt with process certification verification and approvals. If DP Specialty Supplier's process certification paperwork did not match with XS's requirements then SysInteg had two options: first to reject the product or second to approach XS to inquire if the product itself was acceptable based on dimensional specifications? This inquiry was justifiable as there were past incidents when XS had directly communicated to DP accepting engineering deviations but failed to include SysInteg in the information chain.
12.	Response of correction	Usually an email or a phone call from XS or DP Specialty Suppliers, followed with appropriate paperwork.
13.	Tech help online	XS's tech support line for suppliers who required clarifications on product dimensional or materials specifications, and manufacturing process certifications. This was SysInteg's last resort to get clarification about out-of-spec process certifications. Puzzo suggested that the turnaround time could be better. Parker's manager told him that SysInteg was top on the list of XS suppliers who used XS's tech help line.
14.	Supplier	DP Specialty Suppliers—the manufacturer for the spacer-disk packs.
15.	ERP	SysInteg used the internet to track XS's orders on a real time basis. The Website linked to XS's ERP system.
16.	XS	XS facility
17.	Pack and ship	This was the last step at the SysInteg facility. Product shipped to the XS facility.

Source: Created by VSM participants.