Rfid at the metro group

RFID at the Metro Group Mierdorf and Wolfram are preparing their report to the RFID steering committee next month and they have three options to recommend. They can: * Expand the scope of the current pallet level RFID rollout * Move to case level RFID tagging with the manufacturers currently engaged in pallet level rollout * Stop the expansion of the RFID and focus on traditional process improvement opportunities Given the facts in the case and as outlined in more detail in thiscase study, it is our recommendation that Mierdorf and Wolfram move to the case level RFID tagging process. The improvements up and down the supply chain in accuracy, inventory control, reduced labor costs are enough to at least continue with the RFID rollout at the pallet level. However, there is ample financial data that supports quite forcibly the added benefits of RFID at the case level.

Now, with any initiative as bold and challenging as this as far as logistics between manufacturers, distribution centers, and retail stores, implementation oftechnologythat is emerging almost daily, and not to mention the substantial capital expenditures has its inherent risks. We identify those risks later in this study. However, we contend that despite the obstacles that lie ahead, the benefits for this initiative are overwhelming. The potential for this technology given the reporting capabilities, the versatility of product specific inventory levels, and the opportunity to make the RFID tag universal worldwide are endless. Furthermore, as more manufacturers, retailers, shippers, distribution centers, etc. incorporate RFID into their supply chain the more cost effective it becomes for the entire industry. In this study, we examine the process flow of the supply chain; the financial analysis of both pallet level and case level tagging; the risks

associated with RFID tagging at both levels; and conclude with a timeline chart starting from the beginning of the project up to this juncture.

Process flow of the supply chain Pallets are assembled at the manufacturer's plant after the production line. These pallets are either stored at the manufacturer's warehouse or shipped to a distribution center (DC). From here, the pallets are either shipped to one of Metro's DCs or directly to a Metro store. Commonly, pallets at the Metro DC are unbundled and repackaged as mixed pallets. Pallets sizes can range from 60 to 80 cases per pallet and in extreme situations as much as 900 cases on a pallet. One can imagine the labor force required to receive a pallet from a manufacturer, check it in, break in down and reassemble and then ship it out to a retail location who then must receive it, check it in and break it down into the cases. At this point, the stockroom must determine how much of the product can be moved directly to the sales floor and how much was to remain in the stock room.

It was common to have to return product marked for the sales floor back to the stock room due to lack of display space. Furthermore, products would be moved within the sales floor for promotional events which necessitated handling the product again. A retail store could receive shipments directly from the manufacturer or from a variety of Metro DC's. The shipments from the manufacturer or Metro DC varied from week to week and store to store. This made it difficult for the stores to anticipate what would be delivered on a day to day or week to week basis. In addition to the various locations the shipments originated, the pallet sizes, the pallet mix, the randomness of the delivery schedules, and the number of times it took to handle the pallets,

there were also the times when the product had to be returned for quality issues or product damage. Process Flow Chart without RFID – Manufacturer Process Flow Chart without RFID – Metro DC Benefits of RFID In general the benefits for implementing the RFID process would be labor productivity, accuracy of inventory count, improved product availability, and reduced costs.

More specifically, the case study identified three areas that would benefit from the implementation of the RFID tagging process. Benefits of RFID at Pallet Level At the pallet level the RFID tagging would make the shipment from the manufacturer more accurate and efficient. With RFID, all pallets could be scanned while being loaded onto the truck. The need for manually scanning the pallets was eliminated and now the truck driver can monitor the pallets being loaded on his truck. Furthermore, the forklift drivers would no longer need to preassemble the pallets and store them in the shipping area in advance of the delivery trucks' arrival. This greatly reduces the need for supervision over the forklift driver. Metro estimated a cost savings to the manufacturer of approximately €0.

20 per pallet shipped. Benefits of RFID at the Case Level At the case level there were two significant areas of improvement. One had to do with the mixed pallet picking at the Metro DC and the other was improving the shelf restocking at the stores. At the Metro DC, pickers were used to reassemble a mixed pallet. The pickers used a hand held scanner to track what cases were picked for the pallet. Metro estimated that the picking errors amounted to . 05% of the cases that were picked.

Using RFID tagging, the process would be automated by the forklift drivers. The RFID could alert the picker if they had too many or too few of the proper cases or if they had picked the wrong case altogether. With these controls in place, the need for additional supervision and rechecking were virtually eliminated. Between the time savings of automatically scanning the picked cases and the elimination of rechecking the 1% cases, Metro estimated a combined savings of about €. 2 per case which amounts to a total savings of € 511, 000 per year. In addition, Metro estimated that with the increased accuracy of the cases shipped to the stores it would greatly reduce if not eliminate the need to send product back to the DC or worse, throw it out. Another beneficiary of the RFID tagging at the case level would be restocking at the stores.

Due to the lag between products being received in the stock room in the mornings and the sales floor being restocked at night, the chances that the store would be under stocked were great. Using an RFID reader in conjunction with point of sale data, the store personnel would easily track inventory levels and restock more efficiently. The restocking efficiency was estimated to boost gross sales by . 05% which would result in an increase in gross profit of €. 05 per additional product sold. Financial Benefits The details and comprehensive analytics are within attachment #1. The attachment describes three main topics: 1.

Hardware, Software, and Maintenance Expenditures 2. Pallet RFID Program Analysis 3. Case RFID Program AnalysisWithin those analytics it provides much of the detail analysis that supports our recommendation. We will provide the following highlights; Hardware, Software and Maintenance Costs,

Productivity and Shrinkage Savings, and NPV/IRR calculations. Initial Hardware and Software Costs | Pallet Costs Per Store| Case Costs Per Store| Hardware Costs| € 8, 500. 00| € 14, 045. 00| Software Costs| € 17, 000.

00| € 28, 090. 00| Total Costs| € 25, 500. 00| € 42, 135. 00| Annual Maintenance for Full Rollout| € 3, 400. 00| € 5, 618. 00| Total Hardware and Software Costs| €11, 118, 000. 00| € 18, 370, 755.

00| Total Maintenance for Full Rollout| €1, 482, 400. 0| € 2, 449, 434. 00| Full Rollout Total Costs| € 12, 600, 400. 00| € 20, 820, 189. 00| When comparing the initial costs for both implementing the pallet or case RFID program the pallet option shows less initial hardware, software, and maintenance cost compared to the case option. The below information will provide further detail of the initial costs. These costs take into account that each retail store (436 initial stores plus an annual increase 1.

5% stores year over year) of under the pallet RFID program would need one portal per store and the distribution centers would need two portals. Whereas, under the case RFID program each store would need the same amount of portals as the pallet program but would require 872 readers at the stores and 50 readers at the DC's. The cost of the software is twice the amount of the hardware costs and the maintenance cost is 20% of the software costs. The distribution centers costs calculations are further detailed below. | Pallet Costs Per DC| Case Costs Per DC| Hardware Costs| € 17, 000. 00| € 30, 862. 00| Software Costs| € 34, 000.

00| € 61, 725. 00| Total Costs| € 51, 000. 00| € 92, 587. 00| Annual Maintenance | € 6, 800. 00| € 12, 345. 00| Total Hardware and Software Costs| € 510, 000. 00| € 925, 869.

00| Total Maintenance for Full Rollout| € 68, 000. 00| € 123, 449. 00| Full Rollout Total Costs| € 578, 000. 00| € 1, 049, 318. 00| The entire hardware, software, and maintenance expense for both the retail stores under the pallet RFID program is €13, 178, 400 and under the case RFID program is €21, 869, 508. While the initial investment of each program are substantially different the costs outlay is only part of the overall evaluation of the program. Productivity and Shrinkage Cost Analysis One of the more interesting items within the analysis is how each program would affect productivity and shrinkage.

Under the pallet RFID program the analytics the program would experience the following over a 5 year period: * Total Shrinkage savings of € 14, 214, 946. 52 * Total Productivity savings of € 568, 214. 400 Under the case RFID program the analytics the program would experience the following over a 5 year period: * Total Shrinkage savings of €65. 02MM * Total Productivity savings of €23. 11MMThe productivity and shrinkage savings is the main driver as to why the net present value and IRR should be used in determining the best options for Metro. Below are the finalNPV and IRRcalculations for each of the options. Pallet RFID Program | Pallet| IRR| NPV sum PV| (€5, 507, 634.

51)| -8%| NPV excel| (€5, 006, 940. 46)| -16%| Case RFID Program (In millions) | Case| IRR| NPV sum PV| € 9. 60 | 21%| NPV excel| € 8. 73 | 10%| It

is evidenced in the analysis that implementing the case RFID program would result in both a positive NPV and a higher rate of IRR. Whereas, implementing the pallet RFID program would result in a negative NPV and a negative IRR. From a Metro perspective it would be advisable to implement the case RFID program over the pallet program. Risks associated with RFID technology RFID tags were still undergoing development and testing.

The first generation tags had problems with country-specific frequencies and power regulations and were not compatible with the existing ISO standards. The second generation tags, Gen 2, were not due to be released until 2006. The Gen 2 tags were meant to become a global standard that were more in line with ISO standards. However, analysts predicted it would take years, possibly even a decade, of testing, implementation, and running systems in parallel with bar codes before RFID would take over as the primary means of product identification. The risks associated with the RFID tag technology manifested into problems for Metro during the initial rollout of pallet level tagging. Suppliers, trying to savemoney, often purchased tags that would not meet Metro's high quality requirements. Also, because suppliers were not formally bound to any brand of tag, tags of low quality or wrong frequency made them unreadable.

To minimize these risks Metro planned to move to the Gen 2 tags in the second phase of the RFID initiative. These new tags would have one global standard, offered improved read rates, and were less expensive. Risks associated with case level tagging Metro knew that RFID implementation at the pallet level would involve significant upfront costs for all parties involved. Suppliers would have to purchase RFID tags and printers and create a

process of attaching the tags to the correct locations on the pallet. Metro would have to purchase additional hardware called portals that are equipped with RFID readers and antennae. In addition Metro would need to design middleware, or software, that would filter the reader's data and send it to the enterprise application. Essentially, both Metro and its suppliers would have to invest in a RFID infrastructure, process design, and training.

Moving to the case level would increase costs for the suppliers as they would have to buy more tags and make significant process changes. Metro would have to make changes o its IT systems in order to distinguish between backroom and selling floor inventory. This data would also have to be combined with point-of-sale data to alert store employees to replenish floor stock from backroom inventories. During the initial rollout of the first phase many suppliers could not participate because of the strict process requirements. Problems of tag placement or missing tags would be compounded at the case level. Also, with the move to the Gen 2 tags Metro would have to replace the old readers with new ones compatible with the new tags. The risks associated with case level tagging could be minimized by moving forward with the major suppliers already involved at the pallet level.

These suppliers would have already invested in the RFID technology and processes so would likely be more receptive and better equipped to continue on to the next phase. Project Strategy Metro's strategy of the project is one ofleadershipand offense. In 2004 when Metro announces its RFID rollout other major retailers, including Wal-Mart and Tesco, have made it clear that they believe RFID technology could significantly improve the supply chain. Since 1999 Metro has taken a lead role in the development of RFID systems.

They are a founding member of Global Commerce Initiative (GCI) whose objective is to enhance global commerce and improve international supply chains. Mierdorf, Metro's CIO, is a co-chairman of GCI and is actively involved with the EPC working group that is designing the Gen 2 tags. GCI is a strong supporter of RFID implementation using the EPC standard.

Clearly the actions and involvement of Metro senior management in the development and implementation of RFID technology demonstrate a company that is focused on an offensive and leading strategy. Productivity levers The productivity levers that the project primarily focuses on are a reduction or complete elimination of manual processes and improvements in labor productivity through automating processes. Existing processes are replaced with more efficient ones. These productivity levers will affect both Metro and their suppliers and include the following: reduced supervision time of trucks being loaded at manufacturers, reduce picking errors at Metro DCs, increase in-stock rate resulting in increase of store sales, and transmission of point-of-sale and inventory data to the suppliers. Timeline The following outline places in order the events that lead up to the current status of RFID practices adhered to by the METRO group and their RFID partners. These events lead into the recommendation from our analysis of the direction the Metro group should move toward in future RFID practices. In addition to the summary of historical business decisions made by the Metro group through 2005 there is also included in the introduction a brief outline referencing to the development of RFID technology and its associated protocols.

In the 1930's remote identification was born with the invention of Radar ID and British aircraft transponders. The development of this technology

continued through to the 1970's where the work of American entrepreneurs on passive transponder identification helped it take a large step forward. By the early 2000's the stage was set for the use of first generation RFID technology in the commercial and retail industry. RFID technology improvement continued to be made from early versions to more standardized specifications and by early 2004 EPC global began developing a new electronic product code protocol called " Gen2". In Dec of 2004 the " Gen2" standard was released. ISO required additional changes to the " Gen2" and changes weren't complete until late 2005. After all the improvements, standardization and development some analysts have still speculated that it could take close to a decade before RFID would be the sole source of product identification.

The Metro group has taken an active role in forging ahead to accelerate the schedule on this technology and drive innovation and implementation. The Metro group, which started back in 1965, was a local wholesale business serving commercial customers in Germany. By the 1970's the Metro group had moved into Europe for a boarder market and retailing as a larger scope of its business mission. By 2005 the Metro group had become the world's third largest retailer with sales of €36. 4 billion and had developed some major clout in swaying industry practices with regards to adoption of the RFID technology. Moving back to 1996 we see that Zygmunt Mierdorf, Metro's CEO, helped create the Metro group information technology IT subsidiary. Then in October of 1999 the Metro group became a founding member of the global commerce initiative or GCI.

Metro's CEO Mierdorf became the co-chairman of GCI and appointed MGI's managing director, Dr. Gerd Wolfram, to co-chair GCI's intelligent tagging working group. Three years later the Metro group launched the Future Store initiative. Wolfram was the executive project manager of the FSI and by 2003 the initiative had been joined by over 40 partners. In early 2004 Metro announced that by Nov 2004 100 Metro suppliers would be using RFID on pallets delivered to 10 warehouses and 250 stores. During the period of time from announcement to roll out on pallet tagging the Metro group deployed RFID readers and associated infrastructure. It develop middleware, created RFID-enabled processes, select suppliers, found internal candidates to help roll out the implementation and helped train the associated parties and partners.

For instance in July of that same year the Metro group opened an innovation center to support partners with RFID implementation. Also during this time period a 12 person steering committee was developed to help oversee all issues related to the RFID roll out. By November of 2004 Metro began deploying RFID at the pallet level to most but not all of its announced stores and distribution centers. Between Nov of 2004 and July of 2005 Metro's read accuracy increased from 30% to 90% which improved the confidence in the technology. By mid 2005 Metro began seeing other benefits including immediate verification of incomplete shipments and truck unloading cut down by 20 min from the old process. Following this first rollout and implementation Analysis was under taken to understand what the next direction would be. After evaluation of the current options both financial and

operational it was determined that moving forward with case-level RFID tagging was optimal and a positive NPV project.

Wolfram and Mierdorf would next be meeting with the management steering committee on December 13th where they would present the findings with recommendation that Metro should proceed with case-level tagging.