



World Class Sensor Computing, Inc.
Value Chain Management Strategy

In January 2014, World Class Sensor Computing's (WCSC) longtime chief executive officer, Angela Joyner, reflected on the many challenges that lay ahead in the coming years. For a little over a decade, WCSC has been one of the most innovative sensor producers in the country. Over this time, WCSC has grown into a formidable mid-size company with 800 employees and annual sales of roughly \$850 million (US). Ninety-eight percent of the sales are from products and approximately two percent are from services.

However, competitive pressures are rising, requiring many critical decisions as WCSC moves forward into the future. WCSC has developed many processes, activities, and networks that allow them to be very successful in the current environment. However, with changing trends and purchase behaviors, Joyner is not sure if the price/performance advantage is as clear-cut and obvious as it had been in past years. The market is shifting to less expensive, low power multi-function sensor systems, with redundancy being a key focus. WCSC must successfully navigate this change. Key decisions regarding many activities and operations must be made, as well as what products and/or services should be offered in the future and, perhaps, which should be discontinued. Joyner is tasked with determining the best course of action that will continue to drive success and innovation far into the future. Joyner has asked the WCSC cross-functional management group to create an integrated evaluation tool that incorporates ROIC, trade, consumer, and strategic factors in determining product retention and deletion recommendations.

Company History

World Class Sensor Computing, Inc. (WCSC) was started in 1999 by a professor of industrial engineering and three graduate students at the University of Illinois. WCSC got its start developing and selling single-function sensor platforms and products. These sensors are often embedded within several other products (e.g., consumer electronics, automotive and transportation products, aerospace and defense products, healthcare products, factory automation, etc.). WCSC experienced significant growth as the demand for "smart" sensors began to significantly increase in the early 2000s. Initially, WCSC outsourced much of its production but subsequently started to invest in its manufacturing capability in hope of becoming more competitive in the market. After a few years, they were finally able to bring production in-house. This allowed them to maintain more control over development cycles and product quality.

Many of their sensor systems can be customized for a particular customer application. WCSC has a very strong brand image as a maker of highly customizable and high-quality sensor systems and integration services. WCSC is well positioned in the "premium" market for sensor systems and technology integration services. Currently, 100% of all their products are manufactured in-house and distributed directly to their customers. This is not a



characteristic of most players in the market. Many of WCSC's technologies are protected by various forms of intellectual property (IP).

Although there has been a push and desire by many that WCSC should become a public company, it has decided to remain privately held at least in the near term. However, it is possible that this changing environment could restart those conversations again. As an employee-owned enterprise, WCSC management is currently very content with creating great value for its employee shareholders.



Technology and Market Characteristics

A sensor is a device that is used to provide feedback and information about the behavior of a targeted artifact. A sensor converts changes in a physical parameter into a signal that informs about the parameter(s) that is/are under investigation. Sensor functionality is typically categorized into four primary areas (figure 1).

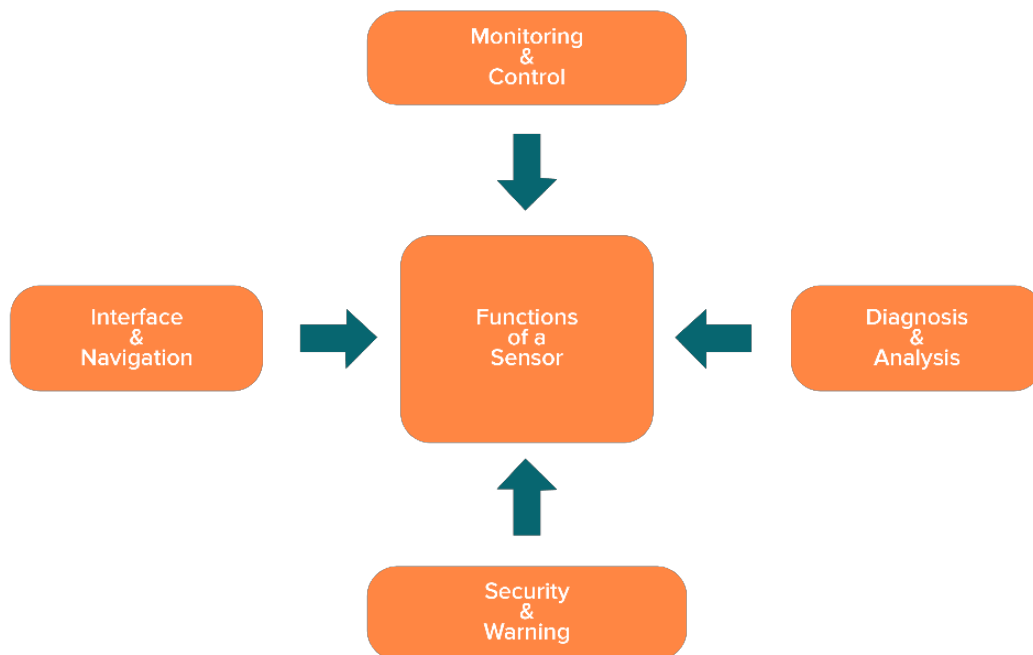


Figure 1: Sensor Functionality Categorization

The sensor market is very much in the growth phase. In 2013, the global market for sensors was valued at \$68 billion. It was predicted to have a compound annual growth rate of 9.8% from 2011–2017. The market is shifting to less expensive multi-function sensor systems, with redundancy and wireless capability being key focal areas. Additionally, the market is driven by new applications and continuous product development. The product development time to market is approximated at 2.0 years. WCSC must successfully navigate this change if it is to have another successful 15 years in the industry.

A driving force behind many of the market changes is the demand for highly connected and smarter products. This has been defined as the Internet of Things (IoT) era. The Internet of Things refers to the networking of physical objects through the use of embedded sensors, actuators, and other devices that can collect or transmit information about the objects (McKinsey, 2014). This is creating an increasing demand for sensors requiring relatively low power at relatively low cost. For example, systems per unit package price is moving from approximately \$85/unit to \$18/unit, but it is anticipated that volume will increase due to more redundancy needs.



Converging product functionality into smaller or more complex product form-factors stresses the importance of reevaluating WCSC's future development strategy. WCSC has the potential to be an impact player in the emerging IoT movement.

WCSC's Competitive Position

WCSC takes great pride in being a recognized leader in the sensor industry given its modest beginning. Joyner believes that their competitive position rests on five pillars: customization capabilities, technical innovation, brand recognition, operational efficiency, and customer care.

Customization Capabilities

Even though WCSC serves a variety of customer segments, they do offer some standard "stock" products. Many of these products are sold to companies looking for some basic functionality and a general solution for their product and/or service. For the most part, WCSC focuses on designing, developing, and manufacturing sensors for specific needs of individual customers in the mid- to high-end sensor market. The customer provides specifications for the sensor system as well as the product(s) in which the sensors would be used. WCSC then designs, develops, manufactures, and embeds the systems into the product for testing. It requires a close relationship with its customers. After implementing any changes as a result of the testing, WCSC then issues a manufacturing, production, and integration plan for sensor and product development for the customer. Most customers have been very pleased by this combination of services. After developing a customized solution, WCSC then offers the solution as a base product, with some of the key client functionalities implemented a little differently.

Technological Innovation

WCSC has been very successful inventing production processes, innovative design techniques, and unique solutions that enable them to be highly responsive to the customer. One of their very intriguing practices is to keep a keen eye on the product development practice of their customers and other potential customers. They often buy one of their customer products, integrate their technology, and then market the sensor system to the customer. They believe that lots of new growth opportunity results from these efforts. Of course, the ability to do this is limited to the lower cost end-products.

With the proliferation of software solutions and wireless technologies, WCSC has started to invest in capability to strengthen their expertise in these emerging areas. Most of these new ventures are targeted by adapting several of their current single-function sensors with more of this type of functionality. WCSC's technological edge allows it to charge prices for its sensor systems and services significantly above the prices that competitors typically charge. Many of these technologies and innovations have been protected as intellectual property.



Brand Recognition

WCSC representatives frequently attend tradeshows. These tradeshows consist of the typical industry participants. However, you will often find WCSC staff attending tradeshows for industries that are new to using sensor technology or had not even considered the vast opportunities for using sensors. The company invests substantially in print advertising and has started to invest in social media to support its marketing and branding programs.

Operational Efficiency

WCSC has always been on the forefront of adopting industry best practices. They have implemented the latest technology to strengthen their manufacturing and product development capabilities. Along with premium pricing, WCSC has often enjoyed a cost advantage. However, with the expected average sensor per unit cost dropping from \$85/unit to \$18/unit, the cost advantage may be eroding. WCSC has consistently used their network of resources to successfully scale for large customer requirements as well as remain nimble enough to successfully supply customers of varying sizes and scope of products.

Customer Care

Responsiveness to their customers has always been a hallmark of WCSC. WCSC has feedback interviews with their customers twice a year. These are very open discussions when the customer can provide very candid information to the organization. These interviews are conducted via online surveys as well as personal interviews with an executive. Additionally, WCSC uses several online forums and training opportunities to better assess the needs of their customers as well as to gain an understanding of their customer's customer. Because their customer focus is so important, WCSC has an executive VP for customer care to ensure that customer engagement with WCSC products and services is considered and included at the very beginning of their strategic development decisions.

The Future

Joyner is pleased with the company's past performance and leadership in these crucial areas. WCSC has grown in ways that were unimaginable when it was a fledgling start-up. The company is now well-known in the industry as a leader of customizable sensor systems and services and is truly exceptional when it comes to being a preferred place to work for a mid-size company.

Joyner understands that the next few decisions to be made will shape the future for WCSC. She wonders about the best way to maintain WCSC's competitive advantage while operating successfully in this changing environment. How will this demand for low cost, multi-function products and more standardized services impact their product offerings and overall performance? What products and/or services will WCSC be offering both in the short-term as well as the long-term?

Cross-Functional Managers Group



WCSC configures their business through a group of industry business units. To keep WCSC vibrant and on the cutting-edge of best business practices, WCSC has a group of cross-functional managers who are charged with understanding the competitive strategy required to be successful across the portfolio of industries. Some of the key industries included are: energy, consumer electronics, automotive & transportation, aerospace & defense, healthcare, and factory automation.

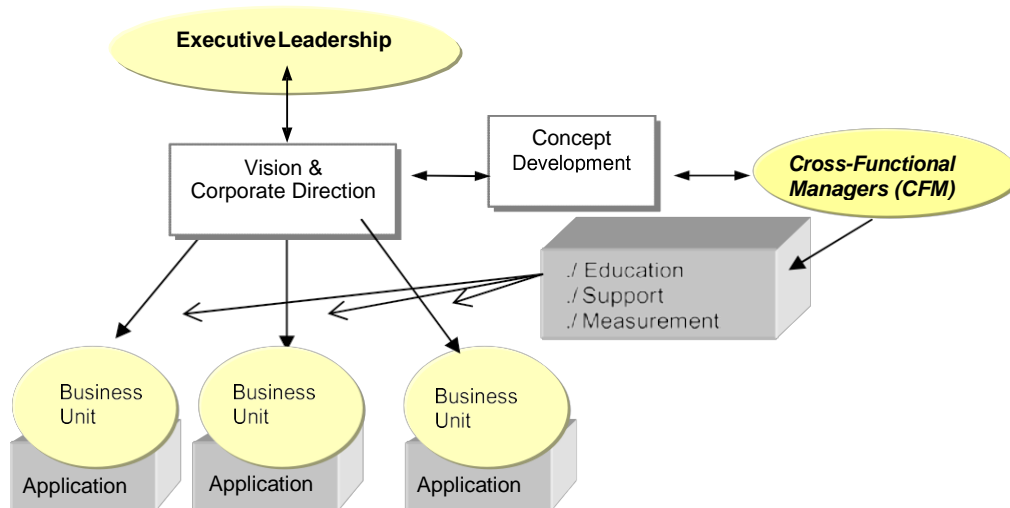


Figure 2: WCSC Strategic Leadership Structure

This executive team evaluates WCSC's performance across multiple levels of the supply chain, retail customer accounts, consumer expectations, as well as benchmarking performance against competitors and best-in-class firms from other industries.

As figure 2 highlights, Executive Leadership constructs the corporate vision, identifies performance gaps, and prioritizes the various corporate objectives. The vision and corporate direction must then be transferred into specific business initiatives via concept development. The Cross-Functional Managers play a major role in concept development by providing internal education, support, and analytical tools. Each individual business unit is responsible for moving business initiatives from concept to reality via the application of specific business practices and processes.

Because of the dynamic market and industry factors, the Cross-Functional Manager team was tasked with evaluating WCSC's value and supply chain. One of the initiatives identified to guide WCSC through this changing time was the optimization of business product lines and/or services offerings.

Currently, working capital is being utilized to develop, distribute, and support several product categories. Joyner would like to have a sense of how each of these categories contributes to the bottom line. She charged the Cross-Functional Managers with identifying an optimal portfolio of WCSC products and/or service offerings. The long-term goal is to realize 90% or more of profits from a minimum of 75% of all product and/or service offerings and



combinations. Ultimately there needs to be a strategy for producing, distributing, and marketing each product and/or service such that it generates a greater return than alternative offerings. With the changing markets, there may need to also be some emphasis on new product development that would more effectively and efficiently address market needs.

Joyner feels that there should be a better link between the product and/or service retention/deletion decision and the product and/or service, and an understanding of impact on return on invested capital (ROIC) is needed (refer to appendices A & B).

The Cross-Functional Managers and the business unit groups face the challenge of:

- **Creating an integrated evaluation tool that incorporates ROIC, trade, consumer, and strategic factors such that a balanced decision about product/service deletion or retention can be made within individual businesses.**

In order to retain consumers and maintain profit levels, it may be important that advertising and trade promotions be focused on transitioning consumers to a newly aligned portfolio. Additionally, it may be necessary that the business team examine profit as well as consumer purchase behavior. In order to differentiate themselves from their competition, WCSC must logically choose the best product-market fit.

If not successfully analyzed and acted upon, WCSC could find itself producing, distributing, and marketing a great number of products to meet the desires of their customers; however, many products could yield low sales volumes, low annual variable contributions, and may dilute the brand image and their competitive position.

Additionally, the role of distributors will continue to expand as the Internet of Things market grows. Simultaneously, distributors can no longer afford to have inventory space utilized by products that do not meet turnover and profit expectations. Therefore, introductions of new products require that other products be removed to maintain the same amount of inventory space. WCSC has historically produced, marketed, and distributed the clear majority of their products. A comprehensive analysis of whether this is financially responsible moving forward will be important in the decision of which current products and/or services should be retained, and which should be dropped, as well as what new product development projects may be considered in the future.

WCSC Today

Today, WCSC is a successful player in the sensor market. Without question, WCSC considers one of its core strengths to be its innovative conception and design of new products and services. Moreover, that innovative capability has had positive spillover effects on production, distribution, and management practices. For example, Joyner oversaw extensive investments in logistics automation in the mid 2000's – raw materials are stored, processed, and readied for distribution extremely efficiently today.

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INDUSTRIES SERVED

WCSC's innovative product development and customization capability has allowed them to serve many diverse industries with a portfolio of products. WCSC's industries include consumer electronics, automotive and transportation products, aerospace and defense products, healthcare products, and factory automation. Figure 3 shows the contribution to revenue by each of the industries.

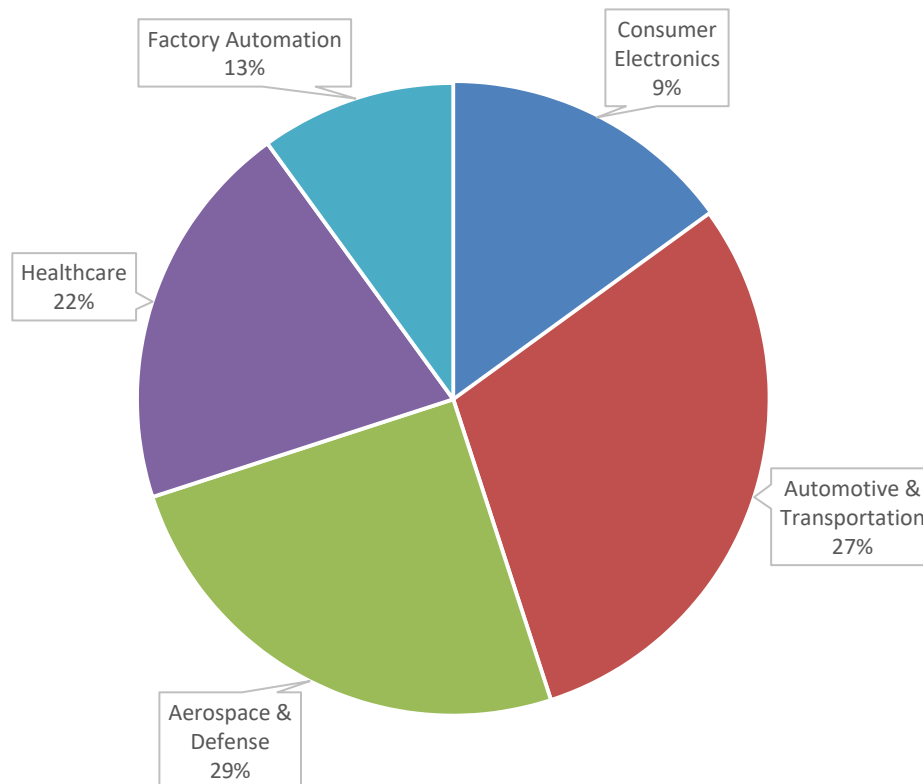


Figure 3: Revenue Contribution by Industry Served

WCSC revenue streams are distributed fairly evenly across multiple industries. However, in the wake of pricing pressures, the impact on the future is not as predictable as in years past. Many sensor customers are seeing cost as well as end-product functionality as key decision factors. WCSC management may need to consider investing more intentionally into platform technologies and more wireless technology in the future.



Consumer Electronics

The consumer electronics industry is a fast-growing industry. However, it is often shaped by trends and popularity. This industry typically needs sensors that are on the lower cost side but may still have significant functionality. WCSC offers a number of sensor systems for customers in this industry. Traditionally, this market has a vast number of products that utilize fairly standard sensor systems but don't require lots of customization. However, as the market is shifting, differentiation of the products themselves is becoming a significant competitive advantage given that many competitors are implementing operational best practices, so operations alone may not be the lever that it has been in the past for creating and leveraging a competitive advantage (exhibits C & D).

Automotive and Transportation

Transportation and automotive product manufacturers are constantly attempting to deliver better designs with the main purpose of moving people and goods across the country. Depending on the type of project, the sensors may require additional customization to suit the needs of the end product. Sensors needed in this industry sector vary across applications. Some of these applications may be single or multi-person transporters or large-scale transportation network products. Working closely with the customers within this segment to understand specific needs can reap great benefits by helping to align with the product development process of automotive and transportation manufacturers (exhibits I & J).

Aerospace and Defense

Within the aerospace and defense industry, a substantial amount of time is focused on engineering. Robustness and reliability are paramount. Building end products and even prototypes is fairly expensive. There is a significant demand for standard single function sensors, but for some mission critical activities, sensor customization is preferred. This could be a relatively high margin opportunity for a sensor producer (exhibits G & H).

Healthcare

The medical equipment market reached \$100 billion in 2014. This includes large-scale electromedical equipment as well as smaller laboratory diagnostic and analysis equipment. Accuracy and validity are critical to medical equipment manufacturers. Like the aerospace and defense industry, this has the potential to be a high margin industry for sensor makers. However, the level of regulations and other requirements can significantly impact product development, and certification of some components used in the equipment may be required. Sensor customization and services may increase the cost of doing business, and the cost may not be fully recovered, depending on the atmosphere surrounding healthcare costs, which impacts all levels in the supply chain from patients to hospitals to medical equipment providers. Once a customer has implemented a critical mass of sensors from a particular vendor, switching cost may be high (exhibits E & F).

Factory Automation

The year 2013 was an exciting time for the manufacturing sector. Technology implementation within this sector is changing the way consumers buy products. Sensor technology has enabled manufactures to have a data-driven approach to plant



and operation optimization. Real-time monitoring and predictive maintenance of plant equipment have demonstrated immediate benefits and return on investment (ROI). The demand for sensors in this industry is typically for off-the-shelf standard components. However, the need for customization is increasing as the result of the convergence of lots of functionality within factory equipment. The communication capacity amongst sensors systems is becoming a key functionality for customers. Interoperability and compatibility are significant purchase decision drivers within this industry (exhibits A & B).



To optimize the type and category of product and/or service bundles to offer, WCSC managers must balance the need to minimize costs and maximize profit potential in light of conflicting business actions. Historically, WCSC has produced and distributed 80% of the products directly to their customers. However, the supply chain for an increasing number of sensor suppliers is going through distributors that provide a number of different types of sensors (figure 4). This also may significantly impact the value chain (figure 5).

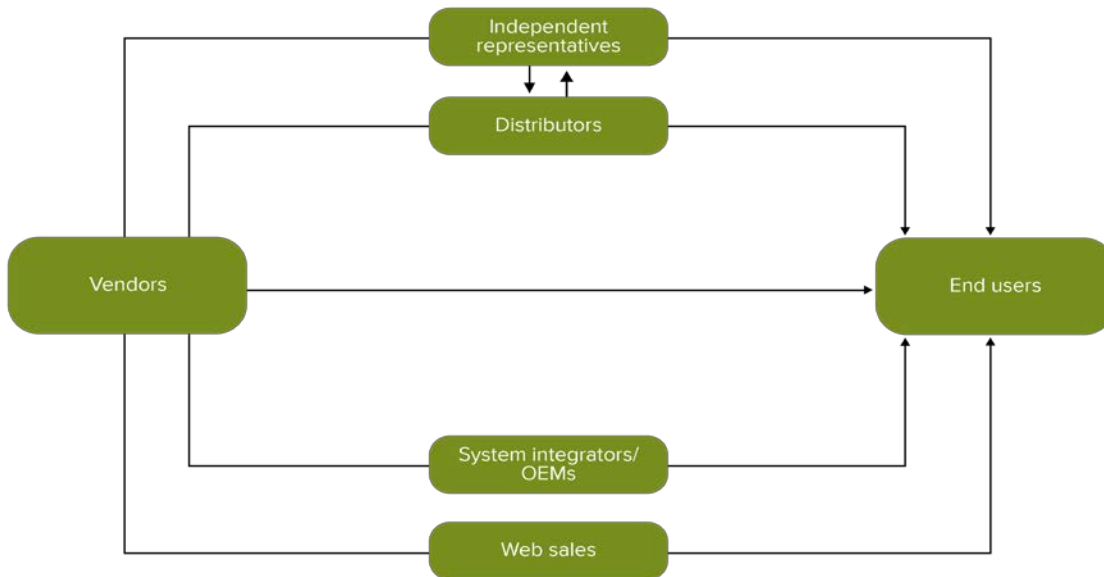


Figure 4: Market Distribution Structure

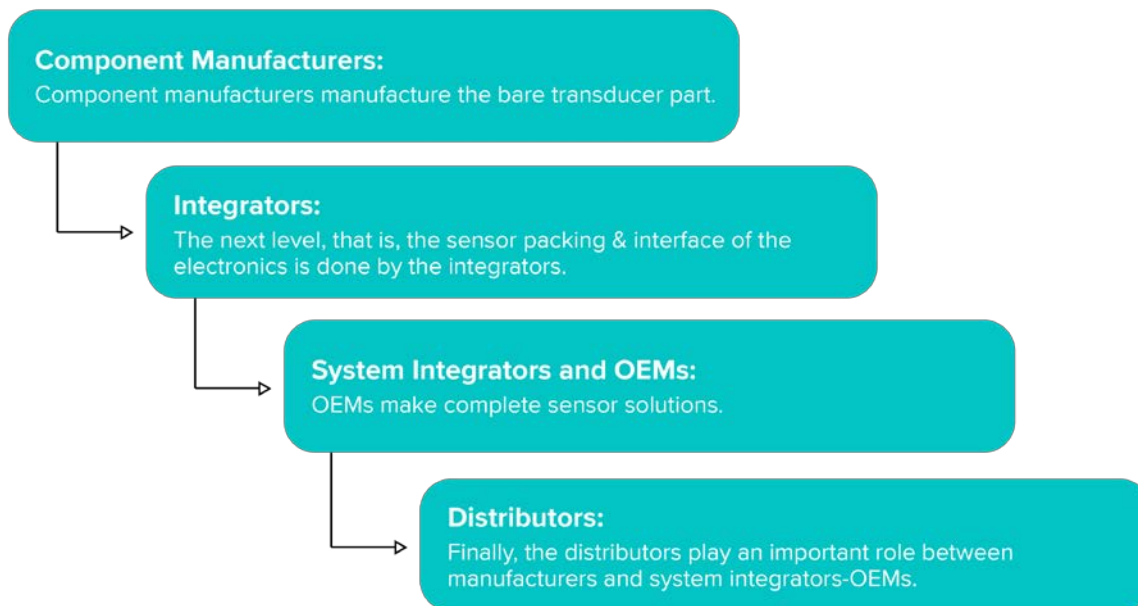


Figure 5: Sensor Industry Value Chain

Balancing Financial, Trade, and Consumer Objectives

Balancing the desires of multiple constituencies means that management may elect not to eliminate a product and/or service that has significant supply chain inefficiencies if the product or service is important to the trade or if it has high consumer value. Every business action taken by WCSC utilizes financial resources. A decision to produce, distribute, and market a product and/or service takes resources away from other possible business actions. WCSC strives to manage its resources in a manner that maximizes long-term returns; however, every action that invests resources in the short-term reduces this return.

For example, the millions of dollars allocated to advertising, trade shows, etc., could be invested in research and development or new plant equipment, or shared with employees/staff in the form of bonuses. Hence, WCSC must allocate capital in a manner that signals to the financial markets that the firm is building future performance potential. Some examples of the trade-offs involved with capital allocation are provided in figure 6.

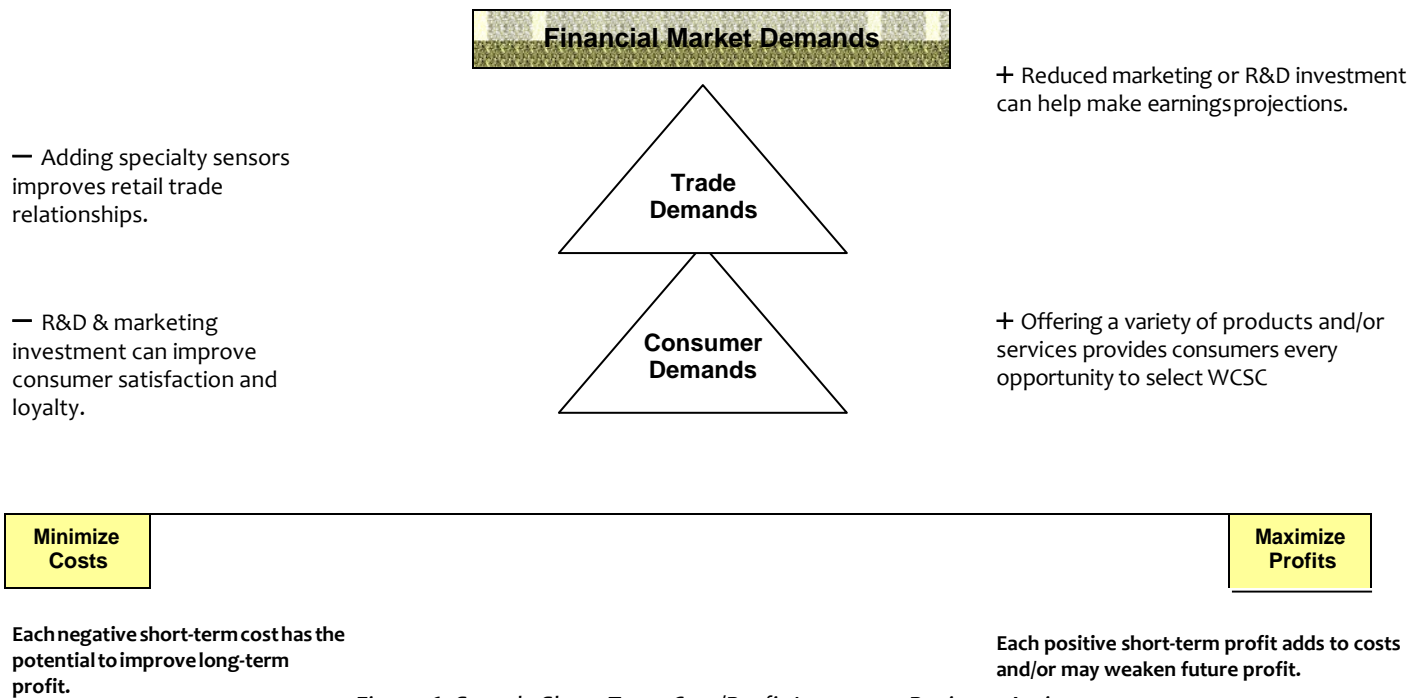


Figure 6: Sample Short-Term Cost/Profit Impact on Business Actions



To help guide decisions regarding the consideration of financial, trade, and consumer objectives, the management team has developed a product/services evaluation matrix:

Figure 7. Sample Decision Matrix

Supply Chain Efficiency	HIGH	I. Cautionary Position High Supply Chain Efficiency Weak Market Performance <u>Recommendation</u> Migrate consumers from discontinued products to other offerings	II. Desirable Position High Supply Chain Efficiency Strong Market Performance <u>Recommendation</u> Strategically allocate promotion budget to maximize return on investment
	LOW	III. Undesirable Position Low Supply Chain Efficiency Weak Market Performance <u>Recommendation</u> Discontinue, reevaluate, or identify opportunities to improve efficiency	IV. Cautionary Position Low Supply Chain Efficiency Strong Market Performance <u>Recommendation</u> Work with Production to improve supply chain efficiency
		LOW	HIGH
		Market Performance	

- I. Cautionary Position –
A product/service falling into this quadrant would exhibit good Return on Invested Capital (ROIC) performance but may not be performing as well as desired among consumers. While this may be an efficient product and/or service to produce and distribute relative to others, it may lack external performance appeal.
- II. Desirable Position –
A product and/or service falling into this quadrant would exhibit good ROIC performance as well as performing well with consumers and the trade. An example would be an efficiently produced product with high or increasing demand that does not require trade/distributor promotions to move volume.

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**III. Undesirable Position–**

A product and/or service falling into this quadrant would exhibit a poor ROIC percentage and a weak consumer following. However, a product and/or service in this quadrant could be favored by some trade or distributors accounts. A product made specifically for an end user that requires special packing and delivery would be an example.

IV. Cautionary Position–

A product and/or service falling into this quadrant would exhibit a poor ROIC percentage but perform well with consumers and be favored by the trade. Large single-function standard sensors that sell in mass and deliver strong un-promoted sales but are expensive for manufactures to produce would fall into this quadrant.

To help the organization fully implement product and/or services offerings optimization, the Cross-Functional Managers (CFM) group needs a tool to examine each product and/or services' consumer performance, trade performance, supply chain efficiency, and strategic relevance to WCSC.

Assessing Supply Chain Efficiency

The CFM recognizes that production of less profitable products and/or services increasingly wastes valuable assets. This is significant because the efficiency with which assets are deployed is a major determinant of the degree of value a firm can create for shareholders. The warehouse space occupied by unprofitable products and/or services could be freed to stock profitable ones. Eliminating unprofitable products would free plant equipment for increased frequency and duration of production runs for profitable products. With continually rising raw material costs, more material could be made available for profitable product production. Simply put, if the cost of the assets required to produce a product is greater than the return on the assets provided by the product, then perhaps the assets should be invested in another product.

One quantitative method of assessing the percentage return on assets is a measure known as Return on Invested Capital (ROIC). ROIC is a three-part measure that: 1) captures the pre-tax earnings of a product by subtracting the costs of a product from the value of sales, 2) accounts for the taxes associated with a product, and 3) assesses the value of sales relative to the value of assets invested in the product.

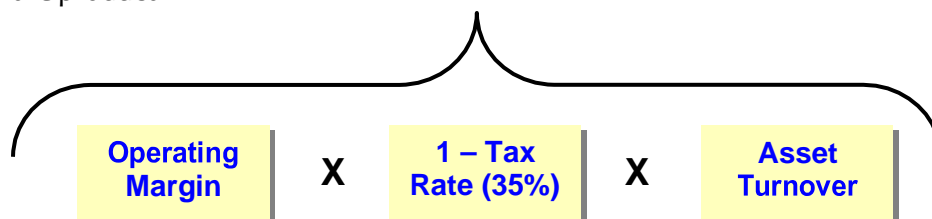




Figure 8. Return on Invested Capital Model

ROIC Model

The operating margin on each product is a ratio of the value of sales after subtracting the costs divided by sales [$\text{Operating Margin} = \frac{\text{Operating Profit}}{\text{Dollar Sales}}$]. The margin on each product is discounted by the taxes associated with the product (35% for the purposes of this case). Finally, a ratio of sales to invested capital is multiplied with the measure resulting in a percentage return on invested capital [$\text{Asset Turnover} = \frac{\text{Sales}}{\text{Invested Capital}}$]. (A visual representation of the calculation and sample computation is provided in appendices A & B).

After calculating the ROIC of a product, the percentage is compared to the cost of the capital (15 % for the purposes of this case) required to produce, distribute, and market the product. A product creates shareholder value when its return on invested capital is greater than the cost of capital (refer to figure 8).

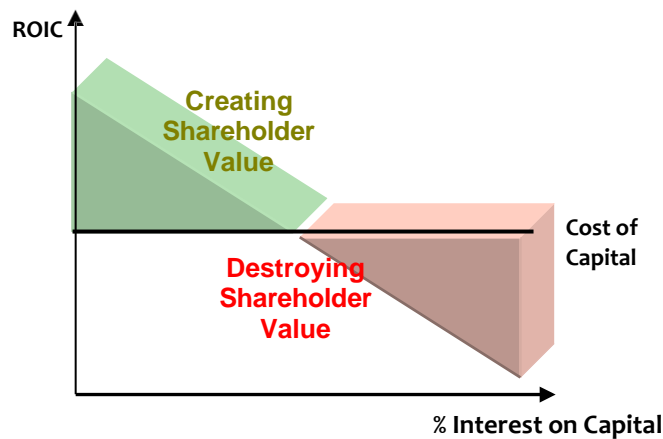


Figure 9: Successful Allocation of Capital

The higher the ROIC, the better the product is at minimizing costs and maximizing profit. However, because a product's **ROIC value DOES NOT incorporate trade and consumer concerns**, the quantitative ROIC value must be evaluated along with the product's qualitative value to the retail trade, distributors, consumers, and WCSC strategic positioning (refer to figure 7). Therefore, it is important to understand the activities in which WCSC is involved and how they fit together to deliver on its value proposition.

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In total, product efficiencies require evaluation at each level of the supply chain to balance financial, trade, and consumer objectives (refer to figure 9).

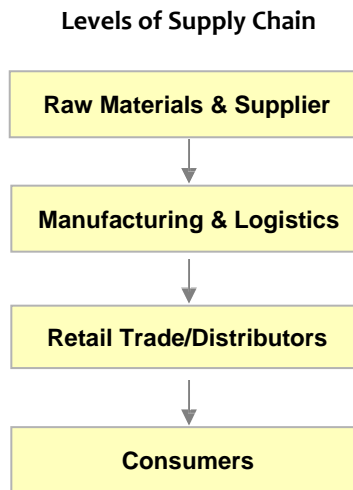


Figure 10: Levels of Supply Chain

Supplier Concerns

Assessing supply chain efficiency at the supplier level entails determining how efficiently raw materials are obtained and deployed by considering questions such as: Does the product require more materials or discrete electronics than comparable sensor products within the product line? Can we supply raw materials internally or do we rely on an external supplier? Are the raw materials immediately ready to use or does it require additional processing? How efficient are materials for the supplier to produce?

Manufacturer Concerns

Assessing supply chain efficiency at the manufacturer level requires determining how efficiently the product is produced by considering machine time, speed of production, time to change machines from production of one product to another, cost of modifying materials, amount of waste, requisite labor, packaging expense, transportation costs, and distribution coverage and cost.

Trade Concerns

Assessing supply chain efficiency at the retail/distributor level necessitates determining how successful



the product is for trade accounts by considering questions such as: Does the product help the retailer and/or distributor distinguish themselves from other retailers or distributors (e.g., an exclusive packaging promotion for some industries/customers)? Are sales of the product increasing or decreasing within the chain? How profitable is the product for the distributor? How many retail or distributor accounts stock the product?

Relationships with potential retailing and distribution trade partners represent a critical consideration in any potential product elimination decision. Consequently, some seemingly inefficient products will need to be maintained to cultivate good working relationships with retail and distributor accounts.

Incorporating the retail and distributor trade partner's perspective is critical since having the wrong product for a given customer base can result in missed opportunities. Well-managed trade relations necessitate supplying the desired assortment of WCSC products, especially as the use of distribution relationships become more important in the future.

Consumer Concerns

Assessing supply chain efficiency at the consumer level involves determining how effectively the product performs with consumers by considering the degree of product loyalty, price sensitivity, repeat purchase patterns, and willingness to migrate to alternative products.

Each sensor product represents a consumer franchise whose willingness to migrate to another WCSC product, as opposed to a competitor product, is critical. One approach to incorporating consumer perspectives on WCSC's product offering optimization initiative is to put each product to a consumer "logic line test" by asking the following question: Are consumers able to quickly understand which product fits his or her needs? If it takes a consumer several minutes to distinguish among the variety of WCSC offerings to determine which product is best for them, then the product line is unfocused and failing to efficiently utilize resources. According to logic line theory, product proliferation may actually reduce consumer loyalty given that every time a new product is offered, the manufacturer must train consumers to seek new and different items as opposed to building consistent repurchase behavior. Consumer reaction to changes in product offerings varies significantly by category and industry.

Current State of the Product Offering Optimization Initiative

At this stage, CEO Angela Joyner and the Cross-Functional Managers group recognize that the firm's financial market valuation is essential to its continued strategic capability. The application of

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value chain initiatives is a central component of WCSC's efforts to maintain superior performance in light of the currently changing market. Specifically, this initiative has the potential to dramatically improve capital allocation and return. As such,

- ***The Cross-Functional Managers group must create an integrated evaluation tool that incorporates ROIC, trade, consumer, and strategic factors in determining product retention/deletion.***

To achieve this, the team must accomplish the following:

1. ***Document the activities in which WCSC engages by constructing an activity map.***
2. ***Analyze the activity map to understand the cost and values drivers and their impact on WCSC's value proposition.***
3. ***Construct an evaluation tool or decision matrix to assess both the quantitative and qualitative value of each product and each business portfolio as a whole.***
4. ***Develop and present a financial model that demonstrates the impact of product retention/deletion or a wait and see approach on ROIC.***

Together, the members of the Cross-Functional Managers group must examine each product's supplier, production, trade, and consumer performance, as well as its strategic relevance to WCSC. Simultaneously, these concerns must be balanced with the product's utilization of resources. To meet CEO Joyner's objective of ensuring that WCSC reflects the firm's value as a well-managed, profitable growth company, the evaluation must provide evidence that the cost of producing, distributing, and marketing each product generates a greater return than alternative products and/or is vital to retailers or consumers.

Product Line Strategic Importance Report from External Consulting Firm:

A consulting firm hired by the cross-managerial committee completed a report assessing which product lines are of the greatest strategic importance over the next 7 years from the perspective of competitor product development, customer capture and emerging technologies.

Product SKU	Strategic Importance (1-5)	Reason
10500	4	Increasing volume of sales
10800	4	Commonly purchased by first time customers
11200	5	Highly similar to competitor

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		product
38	3	Essential Technology in IoT
17	3	Often bought in conjunction with SKU 50
67	5	Highly similar to competitor product
DEF224	3	Commonly purchased by first time customers
DEF 205	4	Interchangeable with competitor product
DEF 220	2	Essential Technology to unmanned aircraft
ATB 116	3	Commonly purchased by first time customers
ATB 103	2	Developed specifically for one large automobile firm
91040	4	Heavily Regulated Product Line
91210	3	Interchangeable with competitor product
91050	2	Cobranding with failing company

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Exhibit A
Factory Automation Balance Sheet 2013
(\$ 000)

Assets	(\$000's)
Cash	4,500
Receivable: Less Allowances	18,500
Inventories	13,250
Prepaid Expenses	82
Allocated Current Assets	<u>(3,500)</u>
Total Current Assets	<u>32,832</u>
Property, Plant and Equipment - Net	45,162
Allocated Property (Total)	5,500
Other Assets	29,751
Total Assets	<u>113,245</u>
Liabilities	
Accounts Payable	2,223
Accounts Payable - Net O/D Reclass	5
Accrued Advertising & Promotions	7,200
Accrued Restructuring	100
Other Accrued Liabilities Short Term Debt	2,157
	-
Deferred Revenue	100
Allocated Current Liabilities	<u>3,460</u>
Total Current Liabilities	<u>15,245</u>
	-
Other Non Current Liabilities	
Division Equity	98,000
Total Liabilities and Net Worth	<u>113,245</u>

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Exhibit B

Factory Automation Sales Data

Product	2011	2012	2013	Net Sales Price	Cost of Sales	Distribution Cost	Trade Spending	Total Variable	Variable Contribution	Fixed	Profit
Code	Unit Sales (000's)	Unit Sales (000's)	Unit Sales (000's)	\$/unit	\$/unit	\$/unit	\$/unit	Costs	per unit	Costs per unit	\$/unit Sold
10000	65	70	85	\$20.00	\$7.25	\$3.50	\$2.50	\$13.25	\$6.75	\$5.35	\$1.40
10100	125	210	390	\$22.50	\$4.95	\$4.50	\$5.73	\$15.18	\$7.32	\$9.25	(\$1.93)
10200	43	50	70	\$16.50	\$5.50	\$4.50	\$5.27	\$15.27	\$1.23	\$7.25	(\$6.02)
10300	21	36	28	\$19.75	\$5.45	\$3.25	\$3.62	\$12.32	\$7.43	\$6.10	\$1.33
10400	65	55	85	\$16.95	\$4.85	\$3.25	\$2.45	\$10.55	\$6.40	\$1.85	\$4.55
10500	110	150	175	\$21.25	\$7.26	\$3.98	\$3.47	\$14.71	\$6.54	\$3.90	\$2.64
10600	200	210	265	\$22.65	\$9.25	\$4.95	\$3.00	\$17.20	\$5.45	\$5.95	(\$0.50)
10700	150	250	389	\$8.95	\$6.50	\$2.95	\$3.95	\$13.40	(\$4.45)	\$3.75	(\$8.20)
10800	69	79	84	\$11.95	\$4.15	\$3.89	\$4.31	\$12.35	(\$0.40)	\$3.00	(\$3.40)
10900	125	175	210	\$22.65	\$8.45	\$4.62	\$3.62	\$16.69	\$5.96	\$4.17	\$1.79
11000	130	150	198	\$14.65	\$6.23	\$4.10	\$3.62	\$13.95	\$0.70	\$2.95	(\$2.25)
11100	950	750	650	\$12.50	\$3.65	\$2.78	\$3.00	\$9.43	\$3.07	\$1.25	\$1.82
11200	650	1,700	1,850	\$13.50	\$3.12	\$2.89	\$1.75	\$7.76	\$5.74	\$5.00	\$0.74
11300	450	650	850	\$22.00	\$7.50	\$8.50	\$3.90	\$19.90	\$2.10	\$7.10	(\$5.00)
11400	650	780	1,100	\$13.50	\$2.65	\$2.25	\$3.62	\$8.52	\$4.98	\$4.22	\$0.76

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Exhibit C

Consumer Electronics Balance Sheet 2013
(\$000's)

Assets	(\$000's)
Cash	3,125
Receivable: Less Allowances	3,563
Inventories	4,791
Prepaid Expenses	14
Allocated Current Assets	
Total Current Assets	<u>11,493</u>
Property, Plant and Equipment - Net	20,124
Allocated Property (Total)	109
Other Assets	1110
Total Assets	<u>32,836</u>
Liabilities	
Accounts Payable	1,671
Accounts Payable - Net O/D Reclass	
Accrued Advertising & Promotions Accrued Restructuring	347
	-
Other Accrued Liabilities	1022
Short Term Debt	2500
Deferred Revenue	-
Allocated Current Liabilities	<u>227</u>
Total Current Liabilities	<u>5,767</u>
Long Term Debt Payable to Others	20
Division Equity	27,049
Total Liabilities and Net Worth	<u>32,836</u>

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iMBA
University of Illinois at Urbana-Champaign

Value Chain Management Capstone
Professor Joe Bradley

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Exhibit D
Consumer Electronics Sales Data

Product	2011	2012	2013	Net Sales Price	Cost of Sales	Distribution Cost	Trade Spending	Total Variable	Variable Contribution	Fixed	Profit
Code	Unit Sales (ooo's)	Unit Sales (ooo's)	Unit Sales (ooo's)	\$/unit	\$/unit	\$/unit	\$/unit	Costs	per unit	Costs per	\$/unit Sold
1	304	297	291	\$4.00	\$0.77	\$0.72	\$0.69	\$2.17	\$1.83	\$0.70	\$1.13
2	249	262	328	\$3.74	\$1.41	\$0.82	\$0.52	\$2.74	\$1.00	\$0.68	\$0.32
3	229	221	184	\$3.87	\$1.98	\$0.79	\$0.88	\$3.64	\$0.23	\$1.11	(\$0.88)
4	204	208	278	\$4.47	\$2.62	\$0.95	\$0.83	\$4.40	\$0.07	\$0.99	(\$0.92)
5	195	137	1	\$3.87	\$1.31	\$0.78	\$0.45	\$2.54	\$1.33	\$1.08	\$0.25
6	171	179	172	\$5.63	\$2.72	\$0.71	\$0.83	\$4.26	\$1.37	\$1.46	(\$0.09)
7	169	180	234	\$7.25	\$2.55	\$0.80	\$0.92	\$4.27	\$2.98	\$1.47	\$1.51
8	162	204	171	\$6.96	\$2.45	\$0.86	\$0.90	\$4.21	\$2.75	\$1.03	\$1.72
9	150	63	10	\$4.26	\$1.99	\$1.00	\$0.69	\$3.67	\$0.59	\$0.95	(\$0.36)
10	119	96	105	\$3.99	\$2.58	\$0.58	\$0.62	\$3.79	\$0.20	\$0.72	(\$0.52)
11	225	400	310	\$7.58	\$1.16	\$0.66	\$0.99	\$2.81	\$4.77	\$0.93	\$3.84
12	500	450	460	\$7.56	\$2.75	\$0.74	\$0.58	\$4.07	\$3.49	\$0.70	\$2.79
13	63	46	39	\$3.24	\$0.93	\$0.68	\$0.33	\$1.94	\$1.30	\$0.56	\$0.74
14	963	940	926	\$3.99	\$1.13	\$0.70	\$0.73	\$2.57	\$1.42	\$0.73	\$0.69
15	56	75	70	\$4.25	\$1.26	\$0.70	\$0.67	\$2.63	\$1.62	\$1.05	\$0.57
16	49	36	70	\$4.07	\$0.83	\$0.68	\$0.76	\$2.27	\$1.80	\$0.73	\$1.07
17	1147	1188	1250	\$5.12	\$1.62	\$0.80	\$0.79	\$3.20	\$1.92	\$1.08	\$0.84
18	41	38	1	\$5.05	\$2.54	\$0.57	\$0.62	\$3.73	\$1.32	\$0.94	\$0.38
19	36	35	49	\$8.25	\$2.02	\$0.66	\$0.90	\$3.59	\$4.66	\$2.32	\$2.34
20	34	34	33	\$4.79	\$1.07	\$0.99	\$0.74	\$2.80	\$1.99	\$0.82	\$1.17
21	31	45	32	\$3.50	\$1.78	\$0.63	\$0.71	\$3.12	\$0.38	\$0.72	(\$0.34)
22	31	46	0	\$3.85	\$2.11	\$0.67	\$0.61	\$3.38	\$0.47	\$0.69	(\$0.22)
23	30	36	42	\$5.42	\$1.82	\$0.75	\$0.71	\$3.28	\$2.14	\$1.43	\$0.71
24	29	26	35	\$3.58	\$1.69	\$0.54	\$0.44	\$2.67	\$0.91	\$0.74	\$0.17
26	28	36	45	\$4.88	\$2.40	\$0.70	\$0.69	\$3.79	\$1.09	\$0.82	\$0.27
27	28	42	56	\$4.66	\$2.78	\$0.84	\$0.65	\$4.26	\$0.40	\$1.03	(\$0.63)
28	26	27	43	\$4.42	\$0.71	\$0.87	\$0.96	\$2.54	\$1.88	\$1.00	\$0.88
29	26	13	-	\$3.74	\$1.33	\$0.79	\$0.66	\$2.78	\$0.96	\$1.07	(\$0.11)
32	24	9	0	\$3.74	\$2.70	\$0.72	\$0.80	\$4.22	(\$0.48)	\$1.09	(\$1.57)
33	23	18	23	\$5.23	\$1.63	\$0.56	\$0.57	\$2.76	\$2.47	\$0.97	\$1.50
34	20	17	16	\$4.73	\$1.10	\$0.53	\$0.84	\$2.46	\$2.27	\$1.03	\$1.24
35	20	28	36	\$5.42	\$1.27	\$0.64	\$0.96	\$2.88	\$2.54	\$1.46	\$1.08
36	20	15	16	\$6.45	\$1.69	\$0.72	\$0.70	\$3.11	\$3.34	\$1.42	\$1.92
38	800	850	1500	\$5.94	\$2.17	\$0.98	\$0.94	\$4.10	\$1.84	\$1.78	\$0.06
39	19	14	16	\$4.64	\$1.52	\$0.71	\$0.45	\$2.68	\$1.96	\$1.02	\$0.94

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40	19	16	16	\$5.04	\$2.24	\$0.98	\$0.35	\$3.58	\$1.46	\$0.88	\$0.58
41	18	12	10	\$5.00	\$1.97	\$0.80	\$0.52	\$3.29	\$1.71	\$0.94	\$0.77

Exhibit D – (Continued)

Consumer Electronics Sales Data

Product	2011	2012	2013	Net Sales Price	Cost of Sales	Distribution Cost	Trade Spending	Total Variable	Variable Contribution	Fixed	Profit
Code	Unit Sales (000's)	Unit Sales (000's)	Unit Sales (000's)	\$/unit	\$/unit	\$/unit	\$/unit	Costs	per unit	Costs per unit	\$/unit Sold
42	17	10	13	\$5.29	\$2.62	\$0.65	\$0.98	\$4.25	\$1.04	\$0.97	\$0.07
43	16	16	20	\$5.13	\$1.71	\$0.68	\$0.58	\$2.97	\$2.16	\$1.27	\$0.89
44	16	18	2	\$7.59	\$2.14	\$0.51	\$0.85	\$3.50	\$4.09	\$1.47	\$2.62
45	1110	1014	812	\$6.50	\$0.89	\$0.76	\$0.78	\$2.43	\$4.07	\$0.45	\$3.62
46	805	747	640	\$7.50	\$1.25	\$0.51	\$0.94	\$2.70	\$4.80	\$0.45	\$4.35
47	763	842	1134	\$2.02	\$1.88	\$0.87	\$0.69	\$3.43	(\$1.41)	\$0.44	(\$1.85)
48	544	667	574	\$2.18	\$0.93	\$0.59	\$0.24	\$1.75	\$0.43	\$0.44	(\$0.01)
49	448	432	385	\$6.50	\$1.00	\$0.84	\$0.96	\$2.80	\$3.70	\$0.45	\$3.25
50	1350	1450	1390	\$6.78	\$1.00	\$0.65	\$0.71	\$2.35	\$4.43	\$0.44	\$3.99
51	900	1000	965	\$2.18	\$1.87	\$0.94	\$0.38	\$3.18	(\$1.00)	\$0.44	(\$1.44)
52	262	241	180	\$2.37	\$2.76	\$0.92	\$0.64	\$4.33	(\$1.96)	\$0.60	(\$2.56)
53	243	260	342	\$5.89	\$1.58	\$0.50	\$0.50	\$2.58	\$3.31	\$0.49	\$2.82
58	148	181	262	\$6.85	\$2.11	\$0.96	\$0.41	\$3.48	\$3.37	\$0.45	\$2.92
60	134	94	161	\$6.50	\$2.71	\$0.96	\$0.38	\$4.06	\$2.44	\$0.45	\$1.99
61	122	115	148	\$7.45	\$2.38	\$0.71	\$0.47	\$3.56	\$3.89	\$0.47	\$3.42
62	79	16	13	\$6.58	\$2.80	\$0.61	\$0.47	\$3.88	\$2.70	\$0.48	\$2.22
63	38	54	56	\$2.16	\$1.56	\$0.64	\$0.80	\$3.01	(\$0.85)	\$0.44	(\$1.29)
64	31	-	-	\$8.50	\$1.53	\$0.76	\$0.97	\$3.26	\$5.24	\$0.44	\$4.80
65	225	211	219	\$3.39	\$1.85	\$0.88	\$0.67	\$3.40	(\$0.01)	\$0.72	(\$0.73)
66	324	310	290	\$3.58	\$1.62	\$0.95	\$0.44	\$3.01	\$0.57	\$0.75	(\$0.18)
67	21	14	16	\$6.50	\$2.53	\$0.71	\$0.63	\$3.88	\$2.62	\$0.45	\$2.17

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Exhibit E

Healthcare Balance Sheet 2013 Business

Assets	(\$000's)
Cash	5,000
Receivable: Less Allowances	20,486
Inventories	18,061
Prepaid Expenses	419
Allocated Current Assets	<u>(4,161)</u>
Total Current Assets	<u>39,805</u>
 Property, Plant and Equipment - Net	 83,536
Allocated Property (Total)	4,276
Other Assets	1,550
Total Assets	<u>129,167</u>
 Liabilities	
Accounts Payable	5,590
Accounts Payable - Net O/D Reclass	3
Accrued Advertising & Promotions	6,400
Accrued Restructuring	142
Other Accrued Liabilities	6,300
Short-Term Debt	-
Deferred Revenue	-
Allocated Current Liabilities	<u>5,570</u>
Total Current Liabilities	<u>24,005</u>
 Long-Term Debt Payable to Others	 0
Other Non-Current Liabilities	0
Division Equity	105,162
Total Liabilities and Net Worth	<u>129,167</u>
	(\$000's)



Exhibit F

Healthcare Business Sales Data

Product	2011	2012	2013	Net Sales Price	Cost of Sales	Distribution Cost	Trade Spending	Total Variable	Variable Contribution	Fixed	Profit
Code	Unit Sales (000's)	Unit Sales (000's)	Unit Sales (000's)	\$/unit	\$/unit	\$/unit	\$/unit	Costs	per unit	Costs per unit	\$/unit Sold
91000	59	54	30	\$37.94	\$18.06	\$0.84	\$4.24	\$23.14	\$14.80	\$6.50	\$8.30
91010	48	43	32	\$43.36	\$11.30	\$1.51	\$4.85	\$17.67	\$25.69	\$7.50	\$18.19
91020	7	3	1	\$35.85	\$13.99	\$0.59	\$3.77	\$18.35	\$17.50	\$10.50	\$7.00
91030	135	59	46	\$33.72	\$13.99	\$0.59	\$3.77	\$18.35	\$15.37	\$11.50	\$3.87
91040	136	523	651	\$30.73	\$10.22	\$0.89	\$3.23	\$14.34	\$16.39	\$6.50	\$9.89
91050	773	771	719	\$29.34	\$9.94	\$0.85	\$3.09	\$13.88	\$15.46	\$4.50	\$10.96
91060	4	4	-	\$27.59	\$9.94	\$0.85	\$3.09	\$13.88	\$13.71	\$10.50	\$3.21
91070	97	64	65	\$33.72	\$10.67	\$0.90	\$3.77	\$15.35	\$18.38	\$12.00	\$6.38
91080	-	25	196	\$30.35	\$12.05	\$0.59	\$3.40	\$16.04	\$14.31	\$5.50	\$8.81
91090	39	16	15	\$32.27	\$12.05	\$0.59	\$3.40	\$16.04	\$16.23	\$6.50	\$9.73
91100	5	4	3	\$35.85	\$11.83	\$0.90	\$3.77	\$16.50	\$19.35	\$3.50	\$15.85
91110	-	132	574	\$34.94	\$14.50	\$0.73	\$3.33	\$18.56	\$16.38	\$12.90	\$3.48
91120	119	121	86	\$29.34	\$9.56	\$0.42	\$3.09	\$13.07	\$16.27	\$11.75	\$4.52
91130	6	8	13	\$29.34	\$8.90	\$0.51	\$3.09	\$12.49	\$16.84	\$8.50	\$8.34
91140	1	1	1	\$32.27	\$10.61	\$0.81	\$3.40	\$14.81	\$17.46	\$8.00	\$9.46
91150	30	24	0	\$27.59	\$9.49	\$0.48	\$3.09	\$13.06	\$14.53	\$7.10	\$7.43
91160	107	106	168	\$27.59	\$8.90	\$0.51	\$3.09	\$12.49	\$15.10	\$5.50	\$9.60
91170	615	625	623	\$26.89	\$7.84	\$0.46	\$2.83	\$11.13	\$15.76	\$3.90	\$11.86
91180	1	2	1	\$25.29	\$8.93	\$0.48	\$2.83	\$12.24	\$13.05	\$6.50	\$6.55
91190	165	127	96	\$29.34	\$10.53	\$0.93	\$3.09	\$14.55	\$14.78	\$8.50	\$6.28
91200	0	0	0	\$27.59	\$10.53	\$0.93	\$3.09	\$14.55	\$13.04	\$7.80	\$5.24
91210	1102	1061	972	\$26.89	\$9.37	\$0.69	\$2.83	\$12.88	\$14.01	\$3.50	\$10.51
91220	532	538	410	\$25.29	\$9.37	\$0.69	\$2.83	\$12.88	\$12.41	\$7.00	\$5.41
91230	73	133	105	\$19.70	\$9.76	\$0.84	\$2.36	\$12.97	\$6.73	\$9.50	(\$2.77)
91240	121	110	127	\$40.34	\$18.06	\$0.84	\$4.24	\$23.14	\$17.20	\$6.50	\$10.70
91250	528	738	808	\$46.13	\$11.30	\$1.51	\$4.85	\$17.67	\$28.43	\$10.15	\$18.28

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Exhibit G

Aerospace & Defense Balance Sheet 2013 Business

(\$000's)

Assets	(\$000's)
Cash	9,000
Receivable: Less Allowances	40,258
Inventories	22,650
Prepaid Expenses	419
Allocated Current Assets	<u>(4,161)</u>
Total Current Assets	<u>68,166</u>
 Property, Plant and Equipment - Net	 75,580
Allocated Property (Total)	4,276
Other Assets	1,550
Total Assets	<u><u>149,572</u></u>
 Liabilities	
Accounts Payable	7,500
Accounts Payable - Net O/D Reclass	9
Accrued Advertising & Promotions	8,400
Accrued Restructuring	900
Other Accrued Liabilities Short Term	
Debt	6,300
	-
Deferred Revenue	8,000
Allocated Current Liabilities	<u>574</u>
Total Current Liabilities	<u>31,683</u>
 Long Term Debt Payable to Others	 -
Other Non Current Liabilities	-
Division Equity	117,889
Total Liabilities and Net Worth	<u><u>149,572</u></u>



Exhibit H

Aerospace & Defense Sales Data

Product	2011	2012	2013	Net Sales Price	Cost of Sales	Distribution Cost	Trade Spending	Total Variable	Variable Contribution	Fixed	Profit
Code	Unit Sales (000's)	Unit Sales (000's)	Unit Sales (000's)	\$/unit	\$/unit	\$/unit	\$/unit	Costs	per unit	Costs	\$/unit Sold
DEF201	150	145	100	\$110.00	\$40.00	\$12.00	\$4.24	\$56.24	\$53.76	\$18.90	\$34.86
DEF202	29	65	45	\$85.60	\$35.00	\$1.51	\$4.85	\$41.36	\$44.24	\$10.00	\$34.24
DEF203	7	3	1	\$75.90	\$43.00	\$0.59	\$3.77	\$47.36	\$28.54	\$11.00	\$17.54
DEF204	135	59	46	\$55.85	\$25.00	\$0.59	\$3.77	\$29.36	\$26.49	\$9.00	\$17.49
DEF205	250	485	600	\$48.50	\$22.00	\$0.89	\$3.23	\$26.12	\$22.38	\$6.00	\$16.38
DEF206	773	771	719	\$62.50	\$42.00	\$0.85	\$3.09	\$45.94	\$16.56	\$8.00	\$8.56
DEF207	9	9	8	\$39.23	\$19.00	\$0.85	\$3.09	\$22.94	\$16.29	\$2.50	\$13.79
DEF208	97	64	65	\$25.96	\$13.65	\$0.90	\$3.77	\$18.32	\$7.64	\$6.00	\$1.64
DEF209	-	25	196	\$32.65	\$12.05	\$0.59	\$3.40	\$16.04	\$16.61	\$11.00	\$5.61
DEF210	39	16	15	\$42.56	\$12.05	\$0.59	\$3.40	\$16.04	\$26.52	\$12.00	\$14.52
DEF211	5	4	3	\$83.60	\$32.00	\$0.90	\$3.77	\$36.67	\$46.93	\$9.00	\$37.93
DEF212	-	132	574	\$42.30	\$14.50	\$0.73	\$3.33	\$18.56	\$23.74	\$10.00	\$13.74
DEF213	119	121	86	\$35.65	\$17.56	\$0.42	\$3.09	\$21.07	\$14.58	\$9.00	\$5.58
DEF214	6	8	13	\$29.34	\$13.00	\$0.51	\$3.09	\$16.60	\$12.74	\$8.00	\$4.74
DEF215	8	9	10	\$32.27	\$10.61	\$0.81	\$3.40	\$14.82	\$17.45	\$10.00	\$7.45
DEF216	30	24	0	\$27.59	\$9.49	\$0.48	\$3.09	\$13.06	\$14.53	\$8.00	\$6.53
DEF217	107	106	168	\$27.59	\$8.90	\$0.51	\$3.09	\$12.50	\$15.09	\$10.00	\$5.09
DEF218	615	625	623	\$26.89	\$7.84	\$0.46	\$2.83	\$11.13	\$15.76	\$8.00	\$7.76
DEF219	9	10	13	\$25.29	\$18.00	\$0.48	\$2.83	\$21.31	\$13.00	\$10.00	\$3.00
DEF220	165	127	96	\$29.34	\$10.53	\$0.93	\$3.09	\$14.55	\$14.79	\$10.00	\$4.79
DEF221	0	0	0	\$27.59	\$10.53	\$0.93	\$3.09	\$14.55	\$13.04	\$11.00	\$2.04
DEF222	500	650	972	\$26.89	\$9.37	\$0.69	\$2.83	\$12.89	\$14.00	\$7.50	\$6.50
DEF223	532	538	410	\$62.35	\$9.37	\$0.69	\$2.83	\$12.89	\$49.46	\$15.00	\$34.46
DEF224	73	133	105	\$19.70	\$9.76	\$0.84	\$2.36	\$12.96	\$6.74	\$9.00	(\$2.26)
DEF225	121	110	127	\$40.34	\$12.00	\$0.84	\$4.24	\$17.08	\$23.26	\$10.00	\$13.26
DEF226	210	350	600	\$39.25	\$11.30	\$1.51	\$4.85	\$17.66	\$21.59	\$8.00	\$13.59

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Exhibit I

Automotive & Transportation Balance Sheet 2013 Business
(\$000's)

Assets	(\$000's)
Cash	5,000
Receivable: Less Allowances	30,600
Inventories	25,061
Prepaid Expenses	419
Allocated Current Assets	<u>(4,161)</u>
Total Current Assets	<u>56,919</u>
Property, Plant and Equipment - Net	95,536
Allocated Property (Total)	4,276
Other Assets	1,550
Total Assets	<u><u>158,281</u></u>
Liabilities	
Accounts Payable	12,590
Accounts Payable - Net O/D Reclass	10
Accrued Advertising & Promotions	15,000
Accrued Restructuring	500
Other Accrued Liabilities Short Term	
Debt	6,300
	-
Deferred Revenue	-
Allocated Current Liabilities	<u>800</u>
Total Current Liabilities	<u>35,200</u>
Long Term Debt Payable to Others	1,250
Other Non Current Liabilities	850
Division Equity	120,981
Total Liabilities and Net Worth	<u><u>158,281</u></u>



Exhibit J

Automotive & Transportation Sales Data

Product	2011	2012	2013	Net Sales Price	Cost of Sales	Distribution Cost	Trade Spending	Total Variable	Variable Contribution	Fixed	Profit
Code	Unit Sales (000's)	Unit Sales (000's)	Unit Sales (000's)	\$/unit	\$/unit	\$/unit	\$/unit	Costs	per unit	Costs per unit	\$/unit Sold
ATB100	90	95	73	\$49.50	\$20.06	\$2.50	\$4.24	\$26.80	\$22.70	\$9.55	\$13.15
ATB101	100	125	150	\$35.35	\$14.30	\$2.60	\$4.85	\$21.75	\$13.60	\$7.60	\$6.00
ATB102	25	19	10	\$25.56	\$15.99	\$1.00	\$3.77	\$20.76	\$4.80	\$1.49	\$3.31
ATB103	135	59	46	\$70.25	\$17.99	\$1.00	\$3.77	\$22.76	\$47.49	\$13.50	\$33.99
ATB104	136	523	651	\$25.50	\$12.22	\$1.00	\$3.25	\$16.47	\$9.03	\$2.50	\$6.53
ATB105	550	600	719	\$31.25	\$11.58	\$1.25	\$6.00	\$18.83	\$12.42	\$7.00	\$5.42
ATB106	14	15	18	\$29.50	\$19.56	\$2.10	\$4.00	\$25.66	\$3.84	\$10.52	(\$6.68)
ATB107	97	64	65	\$39.72	\$10.67	\$1.80	\$5.00	\$17.47	\$22.25	\$12.50	\$9.75
ATB108	-	25	196	\$33.35	\$12.05	\$1.90	\$3.40	\$17.35	\$16.00	\$8.25	\$7.75
ATB109	39	16	15	\$42.25	\$12.05	\$2.10	\$3.40	\$17.55	\$24.70	\$7.50	\$17.20
ATB110	5	4	3	\$37.85	\$11.83	\$1.10	\$3.77	\$16.70	\$21.15	\$6.50	\$14.65
ATB111	-	132	574	\$40.56	\$14.50	\$1.20	\$1.50	\$17.20	\$23.36	\$9.95	\$13.41
ATB112	119	121	86	\$29.34	\$9.56	\$1.50	\$3.09	\$14.15	\$15.19	\$8.90	\$6.29
ATB113	6	8	13	\$32.50	\$8.90	\$0.65	\$3.09	\$12.64	\$19.86	\$11.25	\$8.61
ATB114	40	45	50	\$32.27	\$10.61	\$0.81	\$4.50	\$15.92	\$16.35	\$6.50	\$9.85
ATB115	30	24	20	\$29.56	\$9.49	\$0.98	\$4.25	\$14.72	\$14.84	\$7.90	\$6.94
ATB116	107	106	168	\$27.59	\$8.90	\$2.10	\$3.09	\$14.09	\$13.50	\$15.25	(\$1.75)
ATB117	480	590	623	\$64.23	\$7.84	\$1.69	\$2.83	\$12.36	\$51.87	\$16.50	\$35.37
ATB118	19	20	25	\$25.29	\$8.93	\$1.00	\$5.90	\$15.83	\$9.46	\$0.76	\$8.70
ATB119	165	127	96	\$31.25	\$10.53	\$0.93	\$3.09	\$14.55	\$16.70	\$6.85	\$9.85
ATB120	10	20	15	\$29.65	\$12.19	\$0.93	\$3.09	\$16.21	\$13.44	\$9.50	\$3.94
ATB121	1102	1061	972	\$28.00	\$4.25	\$1.70	\$2.83	\$8.78	\$19.22	\$12.30	\$6.92
ATB122	532	538	410	\$31.00	\$9.37	\$1.65	\$2.83	\$13.85	\$17.15	\$9.50	\$7.65
ATB123	73	133	105	\$22.50	\$9.76	\$1.25	\$2.36	\$13.37	\$9.13	\$6.50	\$2.63
ATB124	100	200	300	\$38.60	\$18.06	\$1.25	\$4.24	\$23.55	\$15.05	\$6.50	\$8.55
ATB125	312	495	780	\$44.23	\$11.30	\$1.75	\$4.85	\$17.90	\$26.33	\$11.25	\$15.08

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APPENDIX A

ROIC Calculation

SKU Code	B₁ 1999 Unit Sales	B₂ (000) 2000 Unit Sales	B₃ 2001 Unit Sales	C Net Sales Price \$/Unit	Cost of Sales \$/Unit	Distributi on Costs \$/Unit	Trade Spending \$/Unit	Total Variable Costs \$/Unit	Variable Contribut ion/Unit	Fixed Costs \$/Unit	A Profit \$/Unit Sold
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$$(1) A \times B_{1-3} = \text{Operating profit} = \text{Unit profit} \times \text{Unit sales}$$

$$(2) C \times B_{1-3} = \text{Dollar sales} = \text{Sales price} \times \text{Unit sales}$$

$$(1) / (2) \text{ OPERATING MARGIN (OM)} = \text{Operating profit} / \text{Dollar sales}$$

$$\text{TAXES} = 1 - 35\% = 0.65$$

$$\text{*ASSET TURNOVER} = \text{sales} / \text{invested capital}$$

$$\text{*Working capital} = \text{Receivables} + \text{Inventories} - \text{Accounts payable}$$

$$\text{Invested capital} = \text{WC} + \text{Property, plant, and equipment}$$

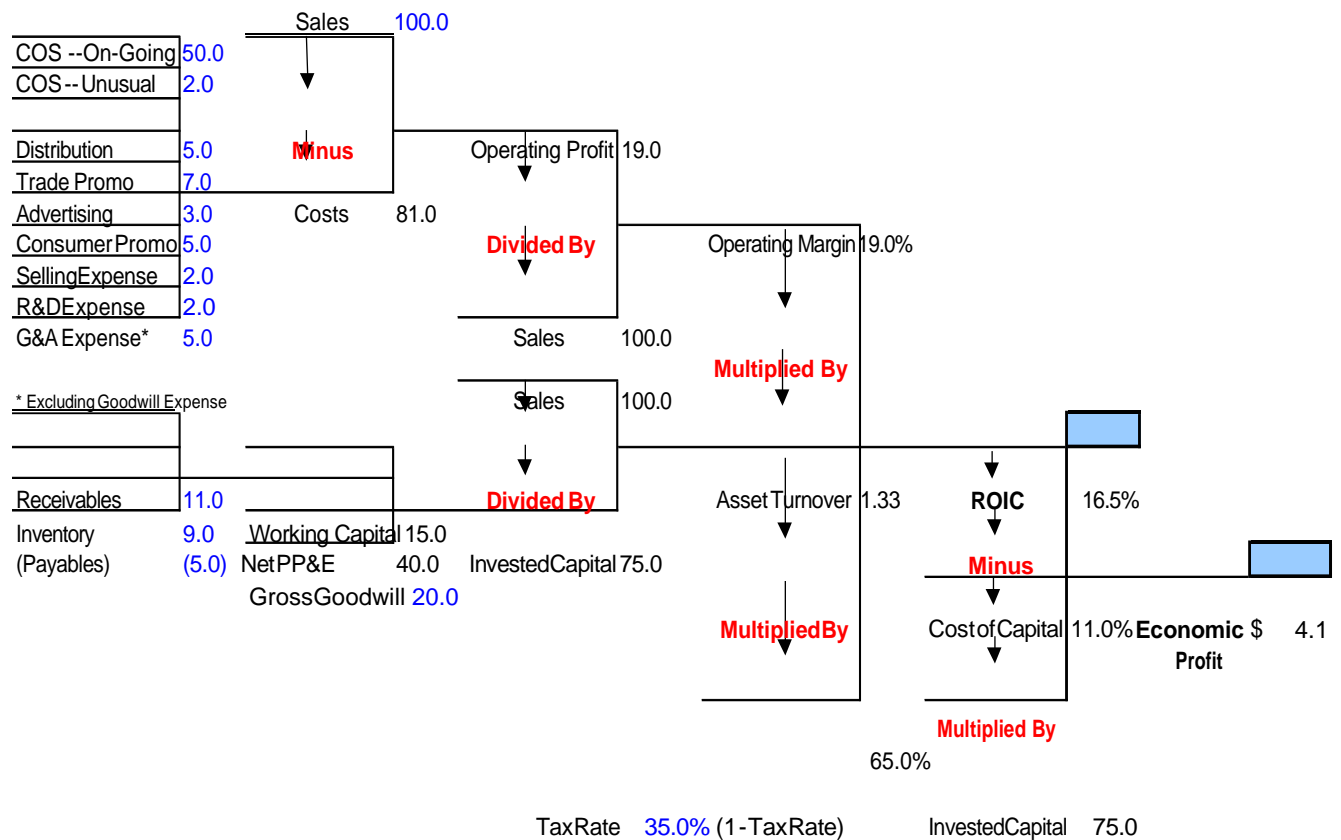
$$\text{ROIC} = \text{OM} \times \text{Tax} \times \text{AT}$$

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APPENDIX B

The ROIC Example



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