THE PENNSYLVANIA STATE UNIVERSITY
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DEPARTMENT OF ACCOUNTING

IFRS ADOPTION IN A LEANING CORPORATION: A STUDY OF THE EFFECTS OF IFRS ON GENERAL ELECTRIC TRANSPORTATION COMPANY

ALEXANDRA R. KLEBE
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Reviewed and approved* by the following:

Karl A. Muller III
Associate Professor of Accounting
Smeal Research Fellow in Accounting
Thesis Supervisor

Orie Barron
Professor of Accounting
PricewaterhouseCoopers Teaching Fellow in Accounting
Honors Adviser

*Signatures are on file in the Schreyer Honors College.

ABSTRACT

The United States manufacturing industry is currently facing several potential changes to its business environment. A prime example of a corporation in this industry that will be encountering multiple developments over the next few years is General Electric Company. In particular, one of its subsidiaries, General Electric Transportation (GETS), is beginning to experience the effects of both voluntary and mandatory changes.

GETS has invested in the "lean" manufacturing initiative, which is a production practice that centers on continuous improvement of the production cycle through eliminating waste and increasing efficiency. While the company has made substantial improvements to the shop floor, it must work hard to avoid the fate of the majority of corporations that create an unsustainable lean system. In order to make the investment last in the long term, GETS must carry the lean philosophy beyond production and into all functions of its business. The most critical area that needs to be "leaned" is its accounting department. GETS's business is driven by finances; in order to fully support a lean production system, the company must develop a lean accounting system.

At the same time, financial reporting changes are underway that may subsequently affect GETS's lean situation. The Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) have been working together to create a converged set of global accounting rules. In 2007, the Securities and Exchange Commission (SEC) intensified the commitment by establishing a roadmap for possible adoption of IFRS by US public companies. The SEC plans to announce a decision in 2011 on whether to require adoption by 2015 or 2016. If IFRS becomes the reporting standard in the United States, GETS will experience significant changes to its financial reporting practices despite current preparations.

This thesis applies the effects of IFRS adoption to a lean accounting system implementation in order to prove that GETS will be benefited by IFRS in creating sustainable lean. The main method of research in this paper is an empirical study of US GAAP and IFRS to determine whether IFRS and its adoption holds benefits for GETS's lean accounting system in the long term. US GAAP and IFRS are first examined from a fundamental perspective. A comparison of their principles reveals that IFRS compliments GETS's lean accounting system with its emphasis on understandability and flexibility. US GAAP and IFRS will be also studied from a regulatory perspective. In particular, areas such as financial statement presentation and expense classification hold benefits for communicating GETS's lean transition to shareholders. The comparison of US GAAP and IFRS is supplemented by a survey of GETS employees and interviews with GETS and academic experts. The views of the individuals experiencing the accounting changes on a first-hand basis contribute to the conclusion that IFRS adoption holds benefits over US GAAP for GETS in the implementation of a lean accounting system.

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Introduction

This thesis draws a conclusion on whether the adoption of International Financial Reporting Standards (IFRS) will benefit American manufacturing corporations in developing a sustainable lean management system in conjunction with a lean accounting system. Important changes are currently underway in both the financial and management accounting world. While efforts to span the gap between financial reporting practices of different countries have been going on for over three decades, momentum has recently risen. Since 2002, the Financial Accounting Standards Board has been working with the International Accounting Standards Board (the Boards) to create a converged set of financial reporting standards. In 2007, The Securities and Exchange Commission (SEC) issued a timeline of projects that, if established satisfactory progress by 2011, would mandate the adoption of IFRS by US public companies in the following four to five years. These plans reflect and support the globalization that is increasingly linking the international business world.

Internally, companies around the world are beginning to revolutionize their management accounting systems. The success of Toyota Motor Corporation over the past five decades has convinced competitors of the legitimacy of the “lean” production system. Manufacturing corporations that attempt to emulate Toyota’s business model are coming to the realization that they must renovate their internal accounting practices to support the lean production system.

These two accounting overhauls will have significant impacts on companies who either choose to undertake the changes or are legally obligated to do so. A great amount of research has

been and will continue to be conducted on the effects of these changes individually. This thesis, however, focuses on combining the two changes. A company must actively work to implement both a lean manufacturing system and supporting accounting system. If the Boards succeed in passing a single set of global standards, that same company will suddenly have to make financial reporting adjustments. What effects will adoption have on the company's attempt to implement lean accounting? Going by the finding that current regulations under US GAAP are contributing to companies' reluctance in creating a lean accounting system, this thesis will examine the adoption of IFRS for aspects that support lean accounting.

General Electric Transportation: Background

A prime example of a company that faces both lean and reporting changes is the Transportation division of General Electric Company, also known as GETS. As part of a US public company that operates in the manufacturing industry, GETS is representative of a corporation that will be greatly affected by both the financial reporting standards changes and lean developments. GETS will serve as the focus from which to draw conclusions on the hypothesis.

General Electric Company is a $159 billion corporation that consists of multiple businesses operating in over 100 countries. Its divisions include Energy Infrastructure, Technology Infrastructure, Capital, NBC Universal, and Home & Business Solutions. GETS falls under the Technology Infrastructure division. With its headquarters located in Erie, Pennsylvania, GETS is a global supplier of locomotives, marine engines, mining vehicle and drill drive systems, wind turbines, and other information technology solutions. Bringing in over $3.5 billion in sales in 2010 and housing more than 8,000 employees, GETS is a substantial

company where business decisions have heavy weight and momentum. See Appendix A for GE's 2010 financials, including supplemental disclosures on its operating segments.

Using GETS as a representative example of US public manufacturing companies, this thesis concludes that IFRS adoption will benefit companies in implementing sustainable lean through a lean accounting system. The following research includes comparison studies and a GETS employee survey to reach this conclusion.

Assumptions

Because the research in this paper concerns events that have yet to occur, assumptions must be made. First, for reasons discussed in the following sections, GETS has not yet implemented a lean accounting system. As will become clear, experts argue that lean accounting is necessary to support the lean production system. Therefore, when US GAAP and IFRS are compared for differences that could benefit GETS, it is assumed that GETS is considering implementing a lean accounting system.

It will also be assumed that while the Boards are working together to pass a single set of converged standards, IFRS will ultimately be adopted as the single international standard. This assumption is based on the adoption of IFRS by the European Union in 2005. Additionally, the SEC has expressed that an opinion that with modification, IFRS is the optimal standard. In 2007, the SEC allowed foreign private issuers to report under IFRS without reconciling to US GAAP. At the date of this paper, convergence between US GAAP and IFRS has occurred in some areas in accordance with the SEC's Roadmap. Therefore, this paper will assume that IFRS regulations will be adopted where differences still exist.

Finally, the cost of IFRS adoption will be disregarded in the determination of whether IFRS holds benefits over US GAAP for a lean accounting system. There have been complaints to the SEC about the substantial costs involved with converting to the international reporting standard. While GETS will have to endure these costs when a single set of regulations is passed, this paper will examine the aspects of IFRS beyond its upfront conversion costs.

The background and significance of the lean manufacturing system will first be explained and then applied to GETS.

Chapter 2

An Examination of Lean and the Need for a New Accounting Paradigm

To clarify why GETS needs to evolve its management accounting system, this paper will first explain the concept of lean and the steps GETS has taken to become a lean corporation. Lean accounting will then be described.

Investing in the Lean Manufacturing System

Over the past five decades, the world has witnessed the effectiveness of lean manufacturing through the success of Toyota Motor Corporation. A concept originated by Henry Ford in the 1920s, lean was popularized by Toyota's Taiichi Ohno who created the Toyota Production System, or TPS. Toyota has since set the standard for modern manufacturing corporations. As companies move away from the traditional mass production business model and towards high-specialization production, they turn to lean to reduce costs and increase profits. In creating sustainable lean manufacturing they face the challenge of translating the TPS principles into tools for improvement.

The central focus of lean around which principles and strategies revolve is to create value for the customer. The customer determines whether a company makes a profit; therefore, every aspect of the production process should be geared towards that end goal. From receiving raw materials to delivering the product, lean has a place in every step (Johnson).

Touted lean principles act as guides for companies' operations. One of the main principles of lean is the elimination of waste. By cutting out non-value added activities, companies decrease their costs while increasing efficiency and available capacity. Organizations also look to reduce the amount of inventory on hand and increase turnover. These goals all

contribute to achieving a shortened production cycle. Another principle that Toyota emphasizes, yet many ignore to their detriment, is respect for employees. When a “command and control” environment transforms into a cooperative one, employees contribute to the lean process, thereby fueling “continuous improvement” (Grasso). With correct planning, management can turn these improvements into long term profits.

Its principles are seemingly common sense, but lean involves “a fundamental paradigm shift from conventional "batch and queue" mass production to product-aligned "one-piece flow" pull production” (Lean Thinking and Methods). Many companies who implement lean, including GETS, must overhaul their production system. Management and employees take part in lean training in order to fully utilize the tools of lean.

One vital tool is value stream mapping. A value stream is the sequence of activities that adds value to the good being produced. It is essentially “the primary organizational requirement for a lean enterprise” (Maskell and Katko 158). Value stream mapping is used to study the flow of materials and information that are needed to make and deliver a product. Its clear visualization of these flows guides the reorganization of production around the value stream. The shop floor is often physically rearranged from functional divisions to work cells where all of the manufacturing steps occur next to each other in sequence. When accomplished, inefficiencies are reduced and flow is increased. Additionally, value stream mapping provides for appropriate performance measurement. Lean expert Jim Huntzinger explains, “The limited operational information generated by the value stream design is directly focused on and around the product or service value stream so that it supports decision making at the operational level.” Business decisions are generated by the actual workings of the company instead of by detached managers.

As a result, value stream mapping works to shape a production cycle that is “pulled” solely by customer demand.

By organizing their operations around the value stream, companies are able to manufacture a product more quickly on demand. While mass production manufacturers traditionally succeeded with their function-divided assembly lines by keeping high inventory on hand, companies today are realizing the importance of shortening their cycle time to survive in a competitive market.

The Challenge of Sustainability

Lean has become the prescribed operating strategy in the modern manufacturing company, but the majority of “leaning” companies are having difficulty making it sustainable. A 2007 census conducted by IndustryWeek and MPI of US manufacturers showed that 70% of plants report employing lean manufacturing, yet only two percent of respondents had “fully achieved” their lean objectives by the time of the survey. According to Jim Huntzinger, the most common reason for such failures is resistance to fully investing the lean philosophy. As a result, while these companies may make some short term gains, they are unable to maintain a lean system to help them accomplish long term goals.

Companies that resist full investment in lean fail to understand how the system truly works. They expect immediate and stable improvements to their bottom line and are deterred when they see the opposite. What companies must understand is that lean is not about instantaneous and steady cost reduction. Rather, lean is about long term cost reductions that come as a result of more efficiently utilizing freed up space (Huntzinger). Financial metrics such as cost-per-volume can initially develop patterns that look poor as the company becomes more

efficient. Figure 1 shows the short term zig-zag pattern of a company's part costs, caused by offsetting incremental cost reductions and new capacity investment.

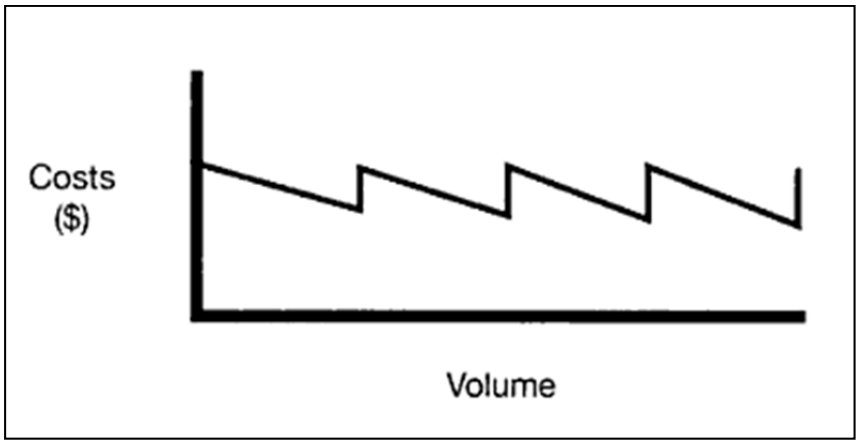

Figure 1: Short term cost-per-volume in a leaning enterprise. (Huntzinger)

Over time, equal cost-per-volume is achieved, but companies need to be ready to handle the short term results. Additionally, a company's financial statements often show lowered profits as inventory is reduced and deferred labor and overhead move from the inventory account on the balance sheet to the expense section of the income statement (Kroll). A successfully leaning company will eventually reduce its work-in-progress inventory to zero and increase inventory turnover, which generates increased cash flow.

The greatest mistake of managers implementing lean is isolating it to the shop floor. Lean must be viewed not merely as a production system, but as a total management system. In order to support the changes that take place in a leaning manufacturing system, managers must align all functions of the business with the lean philosophy. Most companies leave the most important aspect of their company untouched: their accounting system.

The Transformation to Lean at GETS

Celebrating its centennial in 2007, GETS considered the potential of using lean to update its processes. While GE's veteran business know-how has allowed GETS to remain strong in its industry, executives recognized that the company is transforming from a traditional mass production manufacturer to one that is highly specialized. GETS faces tight competition from corporations such as Caterpillar, a machine and equipment manufacturer with 2010 revenues of $42.58 billion, and CSX, an international transportation company with 2010 revenues of $10.64 billion. In order to keep up, its processes must be extremely efficient.

According to Doug Dickinson, Lean Leader for GETS, the Transportation plant's inconvenient layout was "a model of waste" when he arrived. The Erie plant, only one of nine GETS locations, consisted of 364 acres which held 3.2 million square feet of manufacturing space and four miles of testing track (Dickinson). The mass inefficiencies that this century-old plant contained led Dickinson to initiate lean in 2006. GE had declared a lean initiative for its manufacturing subsidiaries, but it was the responsibility of the subsidiaries' Lean Leaders to define a path. Dickinson studied GETS's core product, the locomotive, and set a goal of reducing its production cycle from 31 days to ten.

From 2006 to 2010, GETS worked to reduce waste and increase production efficiency. Leveraging a visit to Toyota by Todd Wyman, VP of Supply Chain, GETS's lean experts oversaw the reorganization of the shop floor into value streams. They introduced standardization to the production cycle. By 2010, locomotive build time was down to ten days.

In an interview with Dickinson, he acknowledged that GETS still has a long way to go. Consequently, the principle of continuous improvement is important at the Erie plant. The company's lean experts have recognized the significance of a cooperative environment and

encourage employees to enroll in *Kaizen* improvement sessions and other lean events to contribute to the process. Dickinson's goal for the subsidiary is to "use standardized processes to create products that are safer to build, are of better quality, and are cost-competitive" with international competitors.

While the company is increasingly dedicating more resources to its lean initiative, GETS faces the reality of being unsuccessful in its goal of becoming a sustainable lean corporation. The reason for this is the same reason that GETS has remained a relatively steady performer for the past century. It is a corporation with set-in-stone values and practices. A sustainable lean company is one that has incorporated the philosophy into every level of the organization. While GETS has made operational changes, it has yet to make a managerial change that is arguably most important. It has not extended lean to its accounting system.

The Necessity of a Lean Accounting System

When managers attempt to lean their shop floors without touching their accounting department, they decrease the sustainability of their efforts. Legacy accounting systems contain performance measures that are designed to support the traditional production model. When a company changes its production model, it should examine its adjacent functions to ensure that they still support the company's operations. The accounting department especially needs to be considered because of its critical relationship to the production system. H. Thomas Johnson, winner of the 2007 Shingo Research Prize, writes that managers who view operational improvements as a "pattern of relationships among a community of interrelated parts" are able to sustain their lean initiatives. Instead, many managers view improvements to their organizations as an "arithmetic sum of separate parts." The managers of this latter group justify keeping their

traditional accounting systems by saying they are maintaining efficiency in accordance with lean principles. Most mangers are aware that financial performance measures drive operations, yet they ignore the fact that a traditional accounting system may be designed to meet a different goal than that of their lean initiative.

Yashurio Monden, Professor of Managerial Accounting and Operations Management at the University of Tsukuba Institute of Socio-Economic Planning in Japan, concludes that "the accounting system must be a subservient system to the production system" (qtd. in Huntzinger 34). Traditional accounting systems were not designed to support lean operations and therefore are not "subservient" by definition. A company is adopting an entirely new view of its production system when undertaking lean; it must similarly accept a new accounting system to support this initiative. Lean accounting was designed specifically to support lean and continues to evolve with the developments that are made in lean. To demonstrate the necessity of adopting lean accounting to round out a total lean management system, the next section first describe the problems with traditional accounting. It will then explain the solutions brought by lean accounting.

Traditional Accounting Dichotomies

Citing external reporting requirements, the majority of American manufacturing companies use traditional accounting systems for internal accounting regardless of their operational goals. Larry Grasso, contributing author to *Lean Accounting: Best Practices for Sustainable Integration,* warns that "the existing accounting management system can be a significant barrier to change for all areas of the company struggling with the lean transformation". Traditional accounting becomes an obstacle to these companies because it holds

goals that are incongruent with those of lean. According to Bruce Baggaley, Senior Partner of BMA Inc., a consulting firm in Cherry Hill, New Jersey, the main goals of a traditional accounting system can be grouped into four categories, shown in Figure 2.

Value	Create value for the shareholders
Results	Obtain targeted strategic goals by measuring results
Management-Led Objectives	Plan operations based on forecasts
Control	Use measurements to control employees

Figure 2: Traditional accounting system goals. (Maskell and Baggaley)

These four goals work to support a traditional mass-production company. When a company implements lean to support a high-specialization production cycle, its accounting system should have new goals.

The Answer: Lean Accounting

The four goals of traditional accounting do not support a company's lean initiative. "As a company transforms itself from traditional mass production to lean manufacturing, the ways you count, control and measure are different," says Brian Maskell, President of BMA Inc. With the development of lean as a business model has come the need for a completely new accounting alternative.

The lean accounting system was developed in the 1990s through the workings of Jean Cunningham, Orry Fiume, and Mark DeLuzio to round out the lean management system. In 2005, the Lean Accounting Summit was held to develop the principles, practices, and tools of

lean accounting. At the Summit, conference leaders presented the vision for lean accounting in the form of its main goals:

1. Provide **accurate, timely, and understandable information** to motivate lean transformation throughout the organization and for decision-making leading to increased customer value, profitability, growth, and cash flow;
2. Use lean tools to **eliminate waste** from the accounting process while maintaining thorough financial control;
3. **Fully comply with GAAP**, external reporting regulations, and internal reporting requirements;
4. Support the lean culture by motivating investment in people, providing relevant and actionable information, and empowering continuous improvement at every level of the organization. (Maskell and Baggaley)

The goals of lean accounting align with the goals of lean. The fundamental ways in they differ from the goals of a traditional system are in terms of value and improvement. The traditional accounting system seeks to create value for the shareholders, while the lean accounting system recognizes the need for financial results but emphasizes value to the customers. A lean accounting system's focus may result in occasional short term losses, but the long run outlook is improved. In terms of improvement, the traditional system has senior management set annual targets that are, by definition, inflexible. The lean accounting system encourages a problem-solving culture "that incorporates continuous feedback mechanisms" (Baggaley 75).

Lean accounting functions similarly to lean on the production floor. When applied, it works to eliminate waste, free up capacity, speed up the process, eliminate errors and defects, and make the process clear and understandable. Though it is a type of management accounting,

lean accounting creates a bridge to the company's financial reports. A relevant example of how lean accounting aligns a company's financials with its lean goals deals with inventory. Traditional accounting depicts inventory as desirable (an asset) because in the past, inventory could serve as collateral. Lean businesses recognize that inventory comes with production, maintenance, and storage costs (Maskell and Katko). When a company drastically reduces its inventory levels, its traditional financial results initially suffer. However, under a lean accounting system, viewers can easily see that reduction of inventory levels results in reduction of wasted space and accompanying operating costs. By developing a lean accounting system to support the lean transition, the organization is able to communicate its improvements externally, and shareholders are pacified.

The fundamental differences between traditional and lean accounting are made evident through practices, which are highlighted in Figure 3.

	Traditional Accounting	**Lean Accounting**
Valuation	Absorption costing, Standard costing, (Activity-based costing)	Direct costing of the value streams
Financial Reporting	Variance reporting	Timely, plain-English statements
Operational Planning/ Reporting	Annual and quarterly budgets; forecasts	Box Scores; Monthly sales, operations, and financial planning processes (SOFP)

Figure 3: Major differences between a traditional and lean accounting system.

While the focus of this thesis is not on the specific practices of lean accounting, the following section demonstrates significant advantages that lean accounting brings to a lean enterprise.

A Move from Standard Costing to Value Stream Costing

A major difference in practice between traditional and lean accounting is in the valuation method used. In accordance with US GAAP, the traditional accounting system uses the absorption costing method for reporting purposes. Many companies, including GETS, prefer to maintain consistency between external and internal accounting. They use standard costing, which is a variation of absorption costing, for their internal reports. Standard costing is considered by lean accounting experts to be "actively harmful to lean" (Maskell and Katko 157). The principles of standard costing are uncomplimentary to the philosophy of lean solely because they were developed to support a 1930s manufacturing corporation (See Appendix B for a breakdown of traditional manufacturing costs). As Brian Maskell points out, "All of the essentials of modern management accounting were established by 1930 …without any significant changes since then" (qtd. in Fiume).

Under the standard costing method, accountants rely on their expertise to create a static set of standard rates. These rates are essentially estimates, and yet they are given substantial credibility. To comply with US GAAP, accountants use variance reporting to reconcile the estimated costs to actual costs. This method creates inefficiencies and drives the wrong behavior for a leaning enterprise. A company only commits itself to sustainable lean by replacing its standard costing method with one that is congruent with the lean theme of change.

Value Stream Costing

Today, companies that produce specialized products at a high turnover rate find standard costing to be inefficient. Waste is created when auditors have to regularly test inventory and adjust it to actual numbers. A lean company will find value stream costing to be the most time-effective method (Maskell and Katko). Instead of allocating costs to products, departments, and overhead, this costing method assigns actual expenses to the values streams. Under value stream costing, managers close the books by summing weekly value stream income statements with "business-sustaining" and other supporting costs. They meet external reporting requirements by making a below-the-line adjustment to include all costs needed to prepare the inventory for its intended use.

Other Lean Accounting Advantages

As its costing method demonstrates, lean accounting values clear and real-time information. It uses easily comprehensible reporting and timely operations tracking to achieve this goal. To communicate information within the company, lean accountants promote using Plain English Profit & Loss Statements. Figure 4 shows a comparison of a traditional and Plain English statement.

Traditional statement:

	This year	Last year
Net sales:	100,000	90,000
Cost of sales:		
Standard cost	48,000	45,000
Purchase price variance	(3,000)	10,000
Material usage variance	(2,000)	5,000
Labor efficiency variance	7,000	(8,000)
Labor rate variance	(2,000)	9,000
Overhead volume variance	2,000	2,000
Overhead spending variance	(2,000)	8,000
Overhead efficiency variance	16,000	(17,000)
Total cost of sales	64,000	54,000
Gross profit	36,000	36,000
Gross profit percentage	36%	40%

Lean statement:

	This year	Last year
Net sales:	100,000	90,000
Cost of sales:		
Purchases	25,300	34,900
Inventory material: (increase)/decrease	6,000	(6,000)
Total material costs	31,300	28,900
Processing costs:		
Factory wages	11,000	11,500
Factory salaries	2,100	2,000
Factory benefits	7,000	5,000
Services and supplies	2,200	2,500
Equipment and depreciation	2,000	1,900
Scrap	2,000	4,000
Total processing costs	26,300	26,900
Occupancy costs:		
Building depreciation	200	200
Building services	2,200	2,000
Total occupancy costs:	2,400	2,200
Total manufacturing costs:	60,000	58,000
Inventory/labor, overhead: (increase)/decrease	4,000	(4,000)
Cost of sales	64,000	54,000
Gross profit	36,000	36,000
Gross profit percentage	36%	40%

Figure 4: Comparison of a traditional and Plain English Profit & Loss statement. (Kroll)

If not all employees can understand the performance measurements that management is communicating through its statements, the information concerning the company's true position is rendered meaningless. When a corporation uses Plain English Statements, it improves the communication among the levels of the enterprise (Cunningham). Accountants are able to express to engineers the metrics that drive sales. At GETS, where definite boundaries exist between the functions in the form of segregated buildings, a Plain English Statement can help to unify its business processes. Employees get a clearer understanding of revenues and expenses by seeing them in layman terms, and the customer benefits as a result. Additionally, the accounting department is able to align its goals with operations because the accounting language is now focused around the value stream. By simplifying the format of the financial statement along with that of the production floor, the company sets itself up for cross-functional cooperation toward sustainable improvement.

Lean accounting pursues its goal of real-time performance feedback by using daily and weekly operations tracking. In particular, box scores like the one featured in Figure 5 create actual-data feedback that can drive performance at the operational level.

		6/2	6/9	6/16	6/23	6/30	7/7	7/14	7/21	7/28	8/4	8/11	8/18	8/25	Goal
OPERATIONAL	Units per Person	15.10	15.63	14.7	15.91	15.90	16.32								20.7
	On-Time-Shipment	100%	100%	100%	100%	100%	100%								100%
	Dock-to-Dock Days	6.00	6.00	6.00	6.00	6.00	5.5								5.5
	First Time Through	80%	80%	81%	85%	85%	87%								92%
	Average Cost	$343	$337	$362	$338	$337	$325								$262
CAPACITY	Productive	29%	29%	29%	28%	28%	28%								40%
	Non-Productive	54%	54%	54%	52%	52%	52%								33%
	Available	17%	17%	17%	20%	20%	20%								27%
FINANCIAL	Revenue	$471	$485	$456	$490	$488	$526								$576
	Material Cost	$123	$125	$129	$132	$135	$137								$139
	Other Variable Costs	$49	$50	$51	$54	$76	$87								$51
	Fixed Costs	$120	$120	$118	$116	$116	$116								$108
	Profit	$179	$190	$158	$188	$161	$186								$278
	Return on Sales	38%	39%	35%	38%	33%	35%								48%

Figure 5: Box score example. (Maskell and Baggaley)

This practice is different than under traditional accounting, which relies on budgets and forecasts derived by upper-level management. When performance is based on static numbers, the company cannot progress far beyond expectations. When performance is tracked dynamically, the company can continuously improve.

An Obstacle to Lean Accounting

Even though lean accounting is a necessity for companies wanting to implement sustainable lean production systems, many are reluctant to discard their legacy accounting systems. A common reason for this unwillingness is the fear of compliance. US companies must abide by US GAAP reporting requirements when issuing financial statements. Since the passing

of Sarbanes-Oxley Act in 2002, compliance costs have risen and US public companies are putting in unprecedented effort and money into meeting raised standards. In 2007, the average SOX compliance cost was $1.7 million (FEI). The underlying perception is that deviating from traditional accounting means conflicting with US GAAP. For example, accountants commonly think that standard costing itself is a GAAP, when in reality US GAAP requires that financial reporting be done with actual costs. For a lean company, value stream costing becomes the simplest method of costing because there is no need for complicated month-end adjustments to standards or variance application calculations. To convey this truth and the overall necessity of lean accounting, the perceptions of accountants need to be changed.

GETS's Reluctance towards Lean Accounting

GETS is a prime example of a company that has transitioned from a mass production manufacturer to a modern leaning enterprise. The company builds a locomotive when they receive an order from a customer. Each locomotive is assembled according to the specific needs of the customer. Because GETS is a limited production, made-to-order manufacturing business, a traditional accounting system does not fit as well as an accounting system designed to support a lean production cycle.

Yet according to Emily Weaver, Deputy Controller for GETS, the company is still using a traditional accounting system that employs standard costing. One of the first General Electric businesses formed by Thomas Edison, GETS remains proudly bound in its traditional corporate values and practices. Complying with US GAAP for several years has established a set way of accounting both externally and internally. As a result, the company's financial results have been affected in ways that could be avoided under a lean accounting system. GE's 2010 annual report

to the SEC states that revenues and earnings for GETS “declined 12% and 33%, respectively, in 2010, and 24% and 51%, respectively, in 2009 as the weakened economy has driven overall reductions in U.S. freight traffic” (SEC). A lean accounting system would support the company in making long term core improvements that could help to restore profits.

While GETS has held on to its traditional accounting system due to corporate tradition, upcoming mandatory changes to its reporting practices could convince it to change to lean accounting.

Chapter 3

Upcoming Financial Reporting Changes: The Adoption of IFRS

Current Standing

Ever since the rampant fraud that resulted in the Sarbanes Oxley Act of 2002, accounting leaders have been leaning towards IFRS as the new US reporting standard. In July 2007, the SEC issued a Concept Release to which the majority of US public company respondents recommended that it require the use of IFRS instead of US GAAP (Hoyle 507). The SEC tested IFRS and determined that as it stood, it was not acceptable as the US reporting standard. As a result of these developments, the SEC developed a tentative roadmap in 2008 for implementing IFRS, step by step, for US public companies. The Commission planned to track its progress until 2011; if in 2011 it determined that the Boards had made significant progress, it would establish more concrete deadlines for mandatory IFRS adoption (See Appendix C for IFRS Roadmap). At the time of this paper, the SEC has not yet made this declaration. In December 2010, SEC Chairman Mary Schapiro made a statement saying the SEC still plans to make a decision on IFRS during the 2011 calendar year. Until that time, the Boards are working on convergence initiatives (shown in Figure 6) in order to strike a balance between rules-based US GAAP and principle-based IFRS.

Convergence Initiatives
Short-term convergence projects
Joint projects
The convergence research project
Liaison IASB member on-site at the FASB offices
Monitoring IASB projects
Explicit consideration of convergence potential in board agenda decisions

Figure 6: Convergence initiatives of the Boards. (Hoyle)

While it remains to be seen whether the SEC will mandate IFRS adoption or continue with its convergence agenda, the SEC has acknowledged that IFRS is in the optimal position for serving as the single set of global accounting standards (IFRS Reporting). Therefore it will be assumed that the SEC will decide to adopt IFRS for US domestic reporting, with US issuers reporting under the system by 2015 or 2016, in order to examine potential future effects.

IFRS as it currently stands will be compared with US GAAP to determine differences that could potentially benefit GETS in implementing a lean accounting system.

GETS's IFRS Preparations

General Electric Transportation is a business subsidiary of General Electric Company (GE) and rolls up its financial results within the GE Company financial statements. Because GE is a US public company, it currently prepares its consolidated financial statements under US GAAP. GETS has foreign affiliates that act as separate legal entities. These legal entities file

financial reports, called statutory filings, with local regulatory and tax authorities. The statutory filings comply with local GAAPs or international standards. In order to report financial results back to GETS headquarters in Erie, these foreign affiliates prepare statements under US GAAP. This is referred to as “GAP” or consolidation reporting.

It should be noted that if the Boards issue a single set of standards, this will help to reduce the reconciliations required of GETS’ affiliates. It will also result in reduction in the risk of conversion errors for GETS. However, this thesis will focus on the specific differences between US GAAP and IFRS that may possibly affect GETS if adoption occurs.

To date, GE Company is addressing current convergence issues through its “STAT-TO-GAP” reconciliation process. According to Emily Weaver, GE’s Corporate Accounting department is responsible for mapping a process that ensures the correct reconciliation of affiliates’ financial results to those of GETS. As the Boards work towards a single set of standards, GETS will be able to streamline its reconciliation process. The Corporate Accounting department is drafting such policies in anticipation of convergence to ease the transition. Additionally, GETS and its parent company provide input to the Boards on industry-specific areas where they see possible issues arising. This effort to stay connected with the process is helping GETS to be ready when IFRS comes into effect in the next few years. Regardless of how prepared GETS is for the change, however, its financial statements and accounting practices will be significantly affected. With this fact in mind, GETS must take into consideration IFRS effects on its core business operations.

Chapter 4

Comparison of US GAAP and IFRS on GETS's Lean Transformation

This section will use empirical research to compare US GAAP and IFRS and determine whether IFRS hold benefits to an American manufacturing company, such as GETS, in its implementation of a lean accounting system. Like many corporations currently holding on to their legacy accounting systems, GETS will be challenged to create sustainable lean. The prior section explained that in order for the company to fully embrace the lean initiative, it must lean every function of the business, including its accounting department. GETS has reasons why it has not evolved to using lean accounting; perhaps conversion to IFRS can give its accountants incentives to do so.

The regulations under US GAAP and IFRS diverge in multiple areas. To ensure a complete understanding of the effects that IFRS adoption will bring to lean accounting, the differences of the old and new regulations must be examined from several perspectives. First, the fundamental characteristics of the standards will be studied. Their specific regulations will then be compared. Finally, the effect of the switch itself will be looked at. From all three perspectives, IFRS will be examined for aspects that either support lean or lean accounting specifically. In an enterprise where lean demands that all functions work in cooperation, the management and financial accounting systems should be similarly unified in nature and purpose. While IFRS regulates external reporting, this section works to draw connections between the new standard and management accounting.

Fundamental Differences

The first way in which US GAAP and IFRS will be compared is by their fundamental characteristics. The dissimilar cultures that surround the standards' origins have had a noticeable impact on their rules. Likewise, the principles behind US GAAP and IFRS have an influence on the behavior of the companies that they regulate. IFRS will be examined to determine characteristics that are conducive to the principles of lean accounting.

The Impact of Clarity

If the SEC requires the use of IFRS instead of US GAAP, it will be mandating a switch from a prescriptive set of regulations to a set that is principle-based. IFRS contains minimum, generalized requirements; its reduced text presents fewer rules to follow and as a result leaves more room for interpretation. It is IFRS's principle-based foundation that, in part, has attracted the SEC. The rule-based approach of US GAAP is suspected by some to have allowed accounting abuse by US companies such as Enron in the last decade. The SEC believes that a financial reporting standard that sets forth generalized principles instead of complex, industry-specific rules will influence corporations to monitor their own compliance. As Professor Suzanne Wright, Instructor of Accounting at Penn State University, puts it, "they will realize that their stock prices are tightly tied to their self governance".

In its quest to create sustainable lean, GETS can benefit from the principle-based International Accounting Standards. On one level, IFRS' simpler set of regulations translates into more efficient accounting practices. On another level, it denotes increased clarity for both issuers and users of financial information.

IFRS agrees with the lean goal of eliminating non-value added work. Traditionally, concentration is required to sift through the complex rules of US GAAP and apply regulations to practices. Switching to IFRS will help companies to reduce the time put towards reporting compliance. Once corporate accountants experience the increased ease of using International Accounting Standards, they may be influenced to cut needless complication out of their managerial practices as well. In several case studies provided by Jean Cunningham, companies who undertake the lean accounting transformation are able to drastically reduce their financial closing period (See Appendix D for case studies). At GETS where locomotive assembly has been reduced to ten days, the Quarter Close period currently lags behind at two weeks. The simplified approach of IFRS may be able to convince GETS's accounting team to take lean-influenced measures in order to better match their manufacturing process's increasing efficiency.

The clarity of IFRS regulations helps to align external reporting with the clear communication of lean accounting reports. IAS1.7 states that "general purpose financial statements are those intended to serve users who are not in a position to require financial reports tailored to their particular information needs." At the Pittsburgh Summit in 2009, G20 leaders reaffirmed the intention of IFRS when they declared:

> We call on our international accounting bodies to redouble their efforts to achieve a single set of high quality global accounting standards within the context of their independent standard setting process […] The IASB's institutional framework should further enhance the involvement of various stakeholders. (Tweedie)

Accounting leaders are striving for increased control by setting a goal of higher communication among stakeholders and corporations. This goal matches that of lean accounting, which advocates the use of Plain English Statements. In a plant where business functions are segregated

by buildings, GETS is in need of better communication around the manufacturing process. When communication increases by means of easily translatable information, these functions will cease to work in isolated "silos." Engineers assembling the locomotive will understand the metrics of the accounting department, and as a result employees will be able to cooperate in a way that raises value for the end user: the customer. With an analogous goal evidenced by its clear text, IFRS has the power to convince management to utilize Plain English Statements to support the lean system.

Flexibility is Key

The principle-based structure of IFRS acts as a model for corporate accounting practices in a second way. Because International Accounting Standards are significantly more generalized, accountants are expected to make interpretations in order to apply the rules to their respective industries. If IFRS is adopted, the attitudes of GETS's accountants will be forced to develop in a way that is favorable to the lean culture.

First, they will learn to be flexible. The accountants will have to regularly apply International Accounting Standards to dynamic, specific accounting situations. In parallel, they will become more comfortable with shaping the company's accounting procedures to support its business goals. The ability to adapt and change is a vital principle of lean. As the Erie shop floor undergoes massive reorganizations and management holds *Kaizen* events, the accounting department must be able to support the business's transitions. The flexibility brought on by IFRS adoption will give them the necessary tools to do so.

Secondly, the accountants of GETS will better fit in with the cooperative culture of lean as a result of IFRS adoption. According to Larry Grasso, management accounting is traditionally

driven by a “command and control” culture. Accountants are the owners of knowledge and distribute it as needed to workers who must act upon it. Conversely, lean requires employees of all levels to work together. IFRS may influence accountants to think in a lean way by demanding them to decipher its broad regulations. Instead of passively translating the regulations of US GAAP, accountants must make active decisions about accounting standard applications. They will move from a role of creating transactions to consulting for the company (Cunningham). Eventually, they will create a closer connection with the company’s production process. Because the accountants must apply IFRS to the company’s operations, they will be more likely to create performance measurements and reports that clearly represent the impact of the lean manufacturing system.

Regulatory Differences

The fundamentals of US GAAP and IFRS carry over to and guide their distinctive regulations. This section will observe the regulations of IFRS for differences that may benefit GETS in a lean accounting system implementation. It will look for IFRS regulations that either are in agreement with the lean philosophy or have features that could be applied to lean accounting. While US GAAP and IFRS have some degree of divergence in almost every area of financial reporting, this section will concentrate solely on the areas that apply to GETS’s manufacturing process, which is the core focus of lean. For example, while there are significant differences between the standards concerning revenue recognition and income taxes, these areas are not covered because they do not directly apply to GETS’s lean production system. Specifically, this section will compare US GAAP and IFRS in the areas of financial statement presentation, expense presentation, and asset write-downs and reversals on an annual reporting

basis. Based on the assumption that IFRS will be adopted, this study considers the effects of IFRS differences as the regulations stand of the date of this paper.

In preparation for US reporting changes, several accounting firms have published guides on the significant differences between US GAAP and IFRS. The findings of Ernst & Young and Deloitte were used as a starting point from which to apply regulation effects to a lean accounting system.

Benefits to a Lean Accounting System

The regulatory updates brought by IFRS adoption hold several benefits for GETS in developing a lean accounting system. Figure 7 lists financial accounting areas that apply to GETS's situation.

	US GAAP	IFRS
Financial Statement Presentation: Financial Periods Required	SEC requires balance sheet for two most recent years and other statements for three-year period ended at the balance sheet date	Requires comparative statements for previous year
Income Statement: Classification of Expenses	Requires classification of expenses based on function	Allows classification of expenses based on function or nature
Inventory: Costing Methods	LIFO is accepted Consistent cost formula for all inventories similar in nature is not explicitly required.	LIFO is prohibited Same cost formula must be applied to all inventories similar in nature or use to the entity.

Figure 7: Comparison of US GAAP and IFRS regulations. (IFRS vs. US GAAP: The Basics)

Comparative Financial Statement Requirement

The SEC requires US public companies to release comparative balance sheets for the two most recent years and other financial statements for the three-year period ended on the balance sheet date. Under IFRS, IAS 1: *Presentation of Financial Statements* requires companies to include only one prior year of comparative statements. This change is considered by some, such as Professor Suzanne Wright, to be a move from greater to less transparency. A first-time viewer will find it easier to perform trending analysis, for example, looking at financial statements that present deeper comparative information up front.

However, the minimum requirements under IFRS hold benefits for a company going lean. Preparing external financial statements will take substantially less time and money. In a production cycle, a lean enterprise makes improvements by utilizing freed capacity. The enterprise's accounting cycle can similarly benefit by using the freed up time and money to support the business's true purpose. Accountants can redirect the time used to prepare comparative information to activities that support the lean production system (Grasso). Viewers can find comparative information by examining past financial statements, but IFRS adoption in this situation promotes the lean philosophy of placing priority in the customer.

Expense Classification Allowance

The freedom that exists in expense classification under IFRS supports both GETS's lean production and lean accounting systems. Under US GAAP, issuers must present expenses by function. The function of expense method separates expenses on the income statement into cost of sales, distribution costs, and administrative costs. The IASB considers this method to provide

"more relevant information to users than the classification of expenses by nature," but acknowledges that it requires arbitrary allocations in certain cases and relies on the judgment of the preparer (Sale 173). If IFRS is adopted, companies will be able to classify expenses by nature or by function. The nature of expense method breaks out specific costs such as depreciation expenses, purchases of material, transportation costs, employee benefits, and advertising costs (See Appendix E for a comparison of function and nature-based expenses). The compilation of expenses by nature is easier than by function because costs do not have to be reallocated among functions. IFRS-regulated companies take industry and business nature factors into consideration when electing an expense method. According to a 2005 KPMG survey of the European Community, "55% of the reporting entities surveyed presented the statement by function of expense and 45% by nature of expense" (qtd. in Wiecek 20). Enterprises can use the option of expense method to their benefit.

The benefit of expense classification choice for GETS is twofold. As GETS reorganizes its production floor into value streams, it faces the challenge of representing the changes to its financial statements in a way that most clearly informs investors of its internal improvements. GETS may find that the nature of expense method is more representative of the expenses incurred by the production cycle. Items such as change in inventory can be broken out to show shareholders the improvements brought by lean. Secondly, if the nature of expense method is indicative of the lean production system and its value streams, GETS will be able tie its financial reporting to a value stream costing system. When the company converts its internal profit & loss statement into an income statement, the below-the-line adjustments will be simpler without a complicated allocation adjustment. The leeway given by IFRS concerning expenses will force GETS to contemplate their handling, which is a thought process encouraged by lean.

Costing Method Requirement

An area that attracts a great deal of commentary is the change in costing upon IFRS adoption. US GAAP allows companies to elect between LIFO (Last In, First Out), FIFO (First In, First Out), and the weighted-average method to value their inventories. Rarely used by international corporations, LIFO currently is commonly employed by US public companies. Under this method in a period of rising prices, the cost of inventory sold (COGS) is higher because it uses the prices of the most recently acquired inventory. As a result, net income is lower. Companies, including GETS, who opt for LIFO have consequently enjoyed lower income taxes. However, if IFRS is adopted, LIFO will most likely be eliminated. Management will have to choose between FIFO and the weighted-average method for costing purposes.

GE currently uses LIFO for 39% of its total inventory; this percentage represents its US businesses (Weaver). Upon IFRS adoption, GETS will most likely revalue its inventory to FIFO to match the method that GE's international businesses use. Under FIFO, inventory costing uses the prices of the company's oldest inventory; as result, lower COGS causes net income to be higher than under LIFO. The difference in income between FIFO and LIFO is called LIFO reserve. In the year that GETS converts to IFRS, it will experience a sudden increase in net income (Leone).

Though GETS will experience increased income taxes as a result of its LIFO reserve liquidation, the mandated switch to FIFO will benefit the company's lean initiative. FIFO emulates the pull system in a lean production cycle. Stored inventory is pulled through the cycle with customer demand and is replaced by newly acquired inventory. FIFO reflects this flow and therefore gives a more accurate representation of current inventory values. It essentially provides closer matching to sales and expenses. GETS managers will have a truer understanding of their

ending inventory, helping them in their lean goal of reducing inventory. Because IFRS brings financial accounting and lean principles in closer alignment, the lean-supporting management accounting system becomes a more attractive option. The increase that FIFO causes in ending inventory has an alternative benefit to GETS. While lean works to reduce inventory, the initial increase in net income created by the LIFO reserve will help to offset the initials drops in financial results that come from lean changes. Requiring GETS's accountants to consider inventory in the same way as its lean experts will help to unite the accounting and production functions.

Nonmaterial Benefits to a Lean Accounting System

Examining US GAAP-IFRS differences reveals areas that hold benefits for lean in theory. Yet these regulatory changes most likely will have only minimal or negligible practical advantages for a lean accounting system. Figure 8 presents such areas.

	US GAAP	IFRS
Financial Statement Presentation: Layout	Detailed requirements under Regulation S-X.	Less prescriptive; includes only list of minimum items.
Inventories and PPE: Reversal of inventory and long-lived asset write-downs	Reversals prohibited	Reversals of write-downs allowed when reasons for impairment no longer exist

Figure 8: Further comparison of US GAAP and IFRS (IFRSs and US GAAP: A Pocket Comparison**)**

Financial Statement Layout Allowance

Companies may find additional efficiency-related advantages of IFRS on financial statement layout. IAS 1 sets forth a list of minimum items required in the financial statements, which is less prescriptive than the details of the SEC's Regulation S-X. According to Deloitte, the significance of this difference is that Regulation S-X requires a specific order in reporting items. As a result, under IFRS an enterprise may be able to shape its financial statements to reflect its lean business purposes. While the difference is most likely not material, GETS can therefore save time on converting internal reports into financial statements.

Asset Write-Down Reversal Allowance

The ability to reverse an asset write-down under IFRS holds theoretical benefits to a lean enterprise. This may or may not hold material benefits for GETS in practice. In a leaning environment where the production space is being condensed and equipment is being taken out of the cycle, long-lived asset (PPE) impairments may be common. On the other hand, the reorganization of the shop floor may also find new use for previously impaired equipment. For example, the reduction of floor space and equipment on the GETS shop floor has allowed the company to use the capacity for a new product: marine engines. The technology, which converts the locomotive engine by essentially flipping it over, uses the same machines as the locomotive process. Equipment that had previously been cut out of the locomotive cycle can now be used in a new application. Under IFRS, GETS is able to reverse the loss on the prior write-down of this equipment. This reversal represents the improvements of lean that under IFRS will be conveyed on the financial statements.

Chapter 5

The Momentum that Reporting Change Brings

The effects of IFRS adoption on a lean accounting system implementation have been examined from a fundamental and regulatory perspective. In order to develop a more complete analysis, this section will study the adoption itself for momentum effects on GETS.

Advocates of the lean management system believe that all aspects of an organization must undergo a transformation for the purpose of sustainable lean manufacturing. Larry Grasso supports this position by stating that in order for any enterprise-wide change to be sustainable, strategy, measures, actions, culture, and structure all must change. GETS has fought this belief by trying to maintain its traditional accounting system, which consists of strategy, measures, actions, culture, and structure that all run against the principles of lean. The company has not experienced motivation great enough to make it create a lean-supporting accounting system.

Despite visiting Toyota and listening to Toyota Production System experts, GETS management has not been convinced that it must implement lean accounting. Grasso explains that in order for the behavior the accounting department to change, positive-reinforcement cycles must be put into place. Strategies must be set that lead to measures by accountants that then lead to actions. If a positive outcome is the result, management will have the confidence to push forward with lean practices, which represent a new culture and structure. With no strategy for change currently set, Grasso's so-called "positive-reinforcement cycle" has yet to be put in place. While the management accounting system that GETS and most US public companies use has evolved over the past two decades, it still proves a hindrance to change.

If a strategy for a lean accounting system is nonexistent, how else can the positive-reinforcement cycle happen? IFRS may be the catalyst for change. The adoption of a new financial reporting system may have the effect of a changed strategy that ultimately leads to GETS changing its management accounting system. GETS is making preparations for possible IFRS adoption, but there are adjustments that the company will not be able to make until the change arrives. Perhaps the momentum that IFRS adoption brings will be enough to give GETS the incentive to establish a lean accounting system.

In order to gauge the momentum of a regulatory change on GETS, a survey was conducted of fifteen GETS employees. Of this number, eleven employees responded. The respondents were representative of the accounting function at the business. Specifically, the group consisted of three managers, five Finance Analysts, and three members of GE's Corporate Audit Staff currently located in Erie. The survey focuses on the responses of employees within the accounting function because this area will be affected most by managerial and financial reporting changes. Sent out by email, the survey asked the following question: "If IFRS is adopted, would you support or resist any simultaneous management accounting changes in addition to the financial accounting changes taking place?" Respondents were asked to respond with either "Support" or "Resist". The survey also included a section where they could explain their reasoning.

Of the eleven respondents, eight replied that they would support accompanying management accounting changes. Their free responses also provided interesting insight. One respondent commented that "Reporting regulations define the way of doing things at GE. Financial accounting changes might change my mindset on other accounting issues." Another wrote that because professional aid would be provided for financial changes, management could

leverage them for management accounting help as well. Of the three respondents who said that they would resist the change, one commented that the “additional time and cost on top of financial reporting compliance will be too much to handle.”

Overall, the results from the survey gather support for the theory that IFRS adoption will create momentum that can carry over to management accounting change. Specifically, several of the comments from the respondents pointed to the effect that a regulatory change could have on their way of thinking. Accountants traditionally hold a bias towards change; on average it takes about 20 years to incorporate new ideas into the accounting world (Grasso). The accounting department at GETS is no exception, but if the company is already going through a mandatory transition in accounting with IFRS, the survey shows that it may be more likely to accept the change to lean accountancy.

Chapter 6

Conclusion

General Electric Transportation has unavoidable decisions to make concerning its accounting practices in the near future. As a manufacturing company pursuing a lean strategy, it must weigh the costs and benefits of developing a supporting accounting system. As a US public company, it must choose a plan of action with regard to financial reporting changes. This thesis worked to draw a conclusion on whether IFRS adoption holds benefits for GETS in establishing a lean accounting system. Through empirical observation of fundamental and regulatory differences between US GAAP and IFRS as well as a survey of GETS employees' opinions, this paper concludes that IFRS has complimentary characteristics for a company transitioning to a lean accounting system.

IFRS adoption is a complex and constantly evolving issue and therefore must be examined from multiple perspectives in order to grasp its effects. In GETS's case, IFRS was found to have more benefits from a fundamental and personal standpoint than a regulatory one. In particular, while changes to financial statement presentation, expense disclosure, and asset treatment requirements influence practices that compliment a lean accounting system, most regulatory differences between IFRS and US GAAP are inconsequential to GETS's lean implementation in practice. On the other hand, the SEC's leaning towards IFRS signals a shift in the behavior of US public companies. The "loosely framed" regulations of IFRS require professional interpretation and a level of corporate responsibility not present with US GAAP. The resulting change in mindset due to IFRS, reaffirmed by the employee survey, proves that GETS can develop an accounting system that supports the lean philosophy. As GETS becomes

more deeply invested in the lean model, it will be faced with the decision of making a complete commitment to the philosophy. While the company has survived for over a century due to its traditional corporate values and practices, it may be able to compete even more strongly in the transportation market if it accepts new ideas.

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Appendix A

General Electric Company 2010 Financial Results

Consolidated Statement of Earnings

For the years ended December 31 (In millions; per-share amounts in dollars)	General Electric Company and consolidated affiliates 2010	2009	2008
Revenues			
Sales of goods	$ 60,812	$ 65,067	$ 69,100
Sales of services	39,625	38,710	43,669
Other income (Note 17)	1,151	1,006	1,586
GECS earnings from continuing operations	–	–	–
GECS revenues from services (Note 18)	48,623	50,495	67,226
Total revenues	150,211	155,278	181,581
Costs and expenses (Note 19)			
Cost of goods sold	46,005	50,580	54,602
Cost of services sold	25,708	25,341	29,170
Interest and other financial charges	15,983	18,309	25,758
Investment contracts, insurance losses and insurance annuity benefits	3,012	3,017	3,213
Provision for losses on financing receivables (Notes 6 and 23)	7,191	10,627	7,233
Other costs and expenses	38,104	37,409	41,835
Total costs and expenses	136,003	145,283	161,811
Earnings (loss) from continuing operations before income taxes	14,208	9,995	19,770
Benefit (provision) for income taxes (Note 14)	(1,050)	1,148	(1,102)
Earnings from continuing operations	13,158	11,143	18,668
Earnings (loss) from discontinued operations, net of taxes (Note 2)	(979)	82	(617)
Net earnings	12,179	11,225	18,051
Less net earnings attributable to noncontrolling interests	535	200	641
Net earnings attributable to the Company	11,644	11,025	17,410
Preferred stock dividends declared	(300)	(300)	(75)
Net earnings attributable to GE common shareowners	$ 11,344	$ 10,725	$ 17,335
Amounts attributable to the Company			
Earnings from continuing operations	$ 12,623	$ 10,943	$ 18,027
Earnings (loss) from discontinued operations, net of taxes	(979)	82	(617)
Net earnings attributable to the Company	$ 11,644	$ 11,025	$ 17,410
Per-share amounts (Note 20)			
Earnings from continuing operations			
Diluted earnings per share	$ 1.15	$ 1.00	$ 1.78
Basic earnings per share	1.15	1.00	1.78
Net earnings			
Diluted earnings per share	1.06	1.01	1.72
Basic earnings per share	1.06	1.01	1.72
Dividends declared per share	0.46	0.61	1.24

Source: General Electric Company Form 10-K, SEC Filing

Consolidated Statement of Changes in Shareowners' Equity

(In millions)	2010	2009	2008
Changes in shareowners' equity (Note 15)			
GE shareowners' equity balance at January 1	$ 117,291	$ 104,665	$ 115,559
Dividends and other transactions with shareowners	(5,701)	(5,049)	1,873
Other comprehensive income (loss)			
Investment securities – net	16	2,659	(3,218)
Currency translation adjustments – net	(3,874)	4,135	(11,007)
Cash flow hedges – net	454	1,598	(2,664)
Benefit plans – net	1,079	(1,804)	(13,288)
Total other comprehensive income (loss)	(2,325)	6,588	(30,177)
Increases from net earnings attributable to the Company	11,644	11,025	17,410
Comprehensive income (loss)	9,319	17,613	(12,767)
Cumulative effect of changes in accounting principles(a)	(1,973)	62	–
Balance at December 31	118,936	117,291	104,665
Noncontrolling interests(b)	5,262	7,845	8,947
Total equity balance at December 31	$ 124,198	$ 125,136	$ 113,612

Source: General Electric Company Form 10-K, SEC Filing

Consolidated Balance Sheet

At December 31 (In millions, except share amounts)	General Electric Company and consolidated affiliates 2010	2009
Assets		
Cash and equivalents	$ 78,958	$ 70,488
Investment securities (Note 3)	43,938	51,343
Current receivables (Note 4)	18,621	16,458
Inventories (Note 5)	11,526	11,987
Financing receivables – net (Notes 6 and 23)	310,055	319,247
Other GECS receivables	8,951	14,056
Property, plant and equipment – net (Note 7)	66,214	68,970
Investment in GECS	–	–
Goodwill (Note 8)	64,473	65,076
Other intangible assets – net (Note 8)	9,973	11,751
All other assets (Note 9)	96,342	103,286
Assets of businesses held for sale (Note 2)	36,887	34,111
Assets of discontinued operations (Note 2)	5,278	15,128
Total assets(a)	$ 751,216	$ 781,901
Liabilities and equity		
Short-term borrowings (Note 10)	$ 117,959	$ 129,869
Accounts payable, principally trade accounts	14,657	19,527
Progress collections and price adjustments accrued	11,142	12,192
Dividends payable	1,563	1,141
Other GE current liabilities	11,396	13,386
Non-recourse borrowings of consolidated securitization entities (Note 10)	30,060	3,883
Bank deposits (Note 10)	37,298	33,519
Long-term borrowings (Note 10)	293,323	336,172
Investment contracts, insurance liabilities and insurance annuity benefits (Note 11)	29,582	31,641
All other liabilities (Note 13)	58,844	58,776
Deferred income taxes (Note 14)	2,840	2,081
Liabilities of businesses held for sale (Note 2)	16,047	6,092
Liabilities of discontinued operations (Note 2)	2,307	8,486
Total liabilities(a)	627,018	656,765
Preferred stock (30,000 shares outstanding at both year-end 2010 and 2009)	–	–
Common stock (10,615,376,000 and 10,663,075,000 shares outstanding at year-end 2010 and 2009, respectively)	702	702
Accumulated other comprehensive income – net(b)		
Investment securities	(636)	(435)
Currency translation adjustments	(86)	3,836
Cash flow hedges	(1,280)	(1,734)
Benefit plans	(15,853)	(16,932)
Other capital	36,890	37,729
Retained earnings	131,137	126,363
Less common stock held in treasury	(31,938)	(32,238)
Total GE shareowners' equity	118,936	117,291
Noncontrolling interests(c)	5,262	7,845
Total equity (Notes 15 and 16)	124,198	125,136

Source: General Electric Company Form 10-K, SEC Filing

Consolidated Statement of Cash Flows

	General Electric Company and consolidated affiliates		
For the years ended December 31 (In millions)	2010	2009	2008
Cash flows – operating activities			
Net earnings	$ 12,179	$ 11,225	$ 18,051
Less net earnings attributable to noncontrolling interests	535	200	641
Net earnings attributable to the Company	11,644	11,025	17,410
(Earnings) loss from discontinued operations	979	(82)	617
Adjustments to reconcile net earnings attributable to the Company to cash provided from operating activities			
Depreciation and amortization of property, plant and equipment	10,013	10,619	11,481
Earnings from continuing operations retained by GECS	–	–	–
Deferred income taxes	1,046	(2,793)	(1,282)
Decrease (increase) in GE current receivables	(126)	3,273	(24)
Decrease (increase) in inventories	342	1,101	(719)
Increase (decrease) in accounts payable	805	(439)	(1,063)
Increase (decrease) in GE progress collections	(1,177)	(500)	2,827
Provision for losses on GECS financing receivables	7,191	10,627	7,233
All other operating activities	5,075	(8,433)	11,214
Cash from (used for) operating activities – continuing operations	35,792	24,398	47,694
Cash from (used for) operating activities – discontinued operations	331	19	959
Cash from (used for) operating activities	36,123	24,417	48,653
Cash flows – investing activities			
Additions to property, plant and equipment	(9,800)	(8,634)	(16,010)
Dispositions of property, plant and equipment	7,208	6,478	10,954
Net decrease (increase) in GECS financing receivables	25,010	42,917	(17,143)
Proceeds from sales of discontinued operations	2,510	–	5,423
Proceeds from principal business dispositions	3,062	9,978	4,986
Payments for principal businesses purchased	(1,212)	(7,842)	(28,110)
Capital contribution from GE to GECS	–	–	–
All other investing activities	7,703	(2,070)	6,168
Cash from (used for) investing activities – continuing operations	34,481	40,827	(33,732)
Cash from (used for) investing activities – discontinued operations	(2,045)	1,551	(1,036)
Cash from (used for) investing activities	32,436	42,378	(34,768)
Cash flows – financing activities			
Net increase (decrease) in borrowings (maturities of 90 days or less)	(1,228)	(26,115)	(48,511)
Net increase (decrease) in bank deposits	4,603	(3,784)	20,623
Newly issued debt (maturities longer than 90 days)	47,642	82,838	116,624
Repayments and other reductions (maturities longer than 90 days)	(100,154)	(85,016)	(68,993)
Proceeds from issuance of preferred stock and warrants	–	–	2,965
Proceeds from issuance of common stock	–	–	12,006
Net dispositions (purchases) of GE shares for treasury	(1,263)	623	(1,249)
Dividends paid to shareowners	(4,790)	(8,986)	(12,408)
Capital contribution from GE to GECS	–	–	–
Purchases of subsidiary shares from noncontrolling interests	(2,633)	–	–
All other financing activities	(3,647)	(3,204)	(1,862)
Cash from (used for) financing activities – continuing operations	(61,470)	(43,644)	19,195
Cash from (used for) financing activities – discontinued operations	(116)	131	(59)
Cash from (used for) financing activities	(61,586)	(43,513)	19,136
Effect of exchange rate changes on cash and equivalents	(333)	795	(685)
Increase (decrease) in cash and equivalents	6,640	24,077	32,336
Cash and equivalents at beginning of year	72,444	48,367	16,031
Cash and equivalents at end of year	79,084	72,444	48,367
Less cash and equivalents of discontinued operations at end of year	126	1,956	255
Cash and equivalents of continuing operations at end of year	$ 78,958	$ 70,488	$ 48,112
Supplemental disclosure of cash flows information			
Cash paid during the year for interest	$ (17,132)	$ (19,601)	$ (25,853)
Cash recovered (paid) during the year for income taxes	(2,671)	(2,535)	(3,237)

See accompanying notes.

Source: General Electric Company Form 10-K, SEC Filing

Operating Segments

Revenues, Assets, PPE, Depreciation and Amortization

Revenues

(In millions)	Total revenues(a) 2010	2009	2008	Intersegment revenues(b) 2010	2009	2008	External revenues 2010	2009	2008
Energy Infrastructure	$ 37,514	$ 40,648	$ 43,046	$ 316	$ 633	$ 1,098	$ 37,198	$ 40,015	$ 41,948
Technology Infrastructure	37,860	38,517	41,605	250	304	372	37,610	38,213	41,233
NBC Universal	16,901	15,436	16,969	105	71	89	16,796	15,365	16,880
GE Capital	47,040	49,746	67,645	1,207	1,469	1,708	45,833	48,277	65,937
Home & Business Solutions	8,648	8,443	10,117	49	33	68	8,599	8,410	10,049
Corporate Items and eliminations	2,248	2,488	2,199	(1,927)	(2,510)	(3,335)	4,175	4,998	5,534
Total	$ 150,211	$ 155,278	$ 181,581	$ -	$ -	$ -	$ 150,211	$ 155,278	$ 181,581

(a) Revenues of GE businesses include income from sales of goods and services to customers and other income.

(b) Sales from one component to another generally are priced at equivalent commercial selling prices.

Revenues from customers located in the United States were $70,506 million, $72,240 million and $85,012 million in 2010, 2009 and 2008, respectively. Revenues from customers located outside the United States were $79,705 million, $83,038 million and $96,569 million in 2010, 2009 and 2008, respectively.

(In millions)	Assets(a)(b) At December 31 2010	2009	2008	Property, plant and equipment additions(c) For the years ended December 31 2010	2009	2008	Depreciation and amortization For the years ended December 31 2010	2009	2008
Energy Infrastructure	$ 38,606	$ 36,663	$ 36,973	$ 954	$ 1,012	$ 1,382	$ 911	$ 994	$ 973
Technology Infrastructure	51,474	50,245	51,863	789	812	1,247	1,643	1,496	1,343
NBC Universal	33,792	32,282	33,781	286	282	131	-	345	354
GE Capital	575,908	607,707	627,501	7,674	6,440	15,325	8,375	9,177	10,226
Home & Business Solutions	4,280	4,955	4,908	229	201	195	354	366	342
Corporate Items									

Source: General Electric Company Form 10-K, SEC Filing

Appendix B

Traditional Cost Structures and Measurement

The reports of Standard Cost accounting do not align with the values of lean. The standard cost report was developed in order to give an accurate representation of the company to shareholders. Lean uses a different route to achieve a goal of customer satisfaction. Its goal is to give managers a clear view of the company's operations through performance measures, allowing them to increase value to customers. Standard cost accounting reports are unable to convey the appropriate visibility needed by Lean managers.

According to Orry Fiume, former VP of Finance for the Wiremold Company, Standard Cost accounting was created to support traditional, mass-production companies of the industrial revolution. Figure 9 shows the change in cost structures between the average manufacturing company in the early 20th century and today:

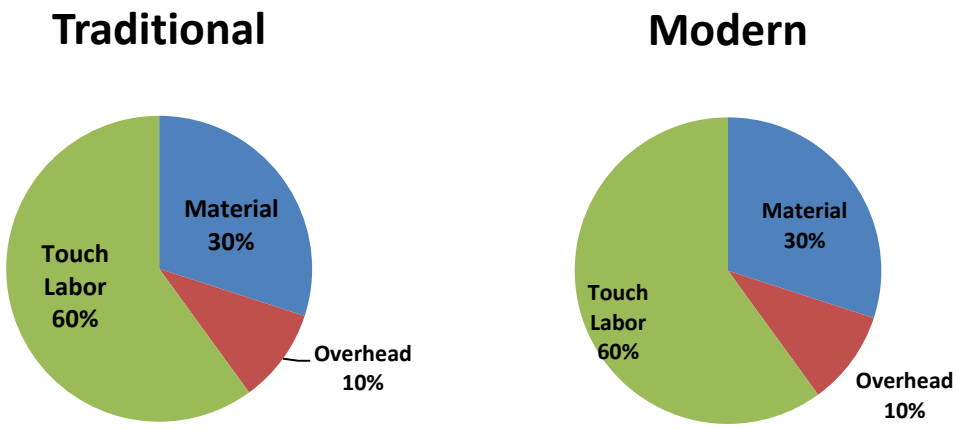


Figure 9: Comparison of the traditional and modern cost structure.

Cost measurement such as labor efficiency and Overhead absorption was applicable to companies were strived to achieve economies of scale by producing large batches of product for

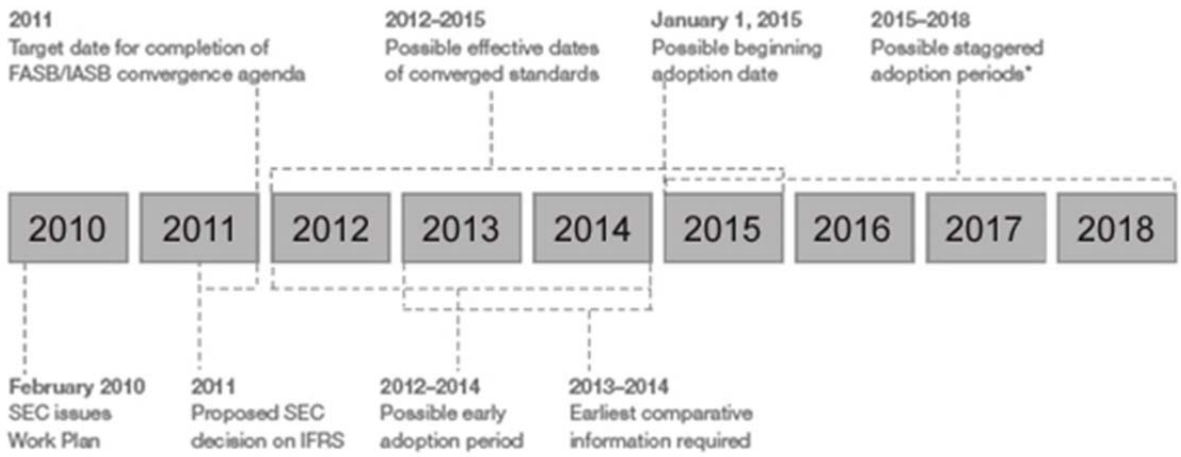
the minimum cost. Management used labor to allocate Overhead. However, today's industries in developed countries, especially in the United States, are moving towards low-volume, highly specialized products. Labor represents a much smaller part of a company's costs. Traditional cost measurements (Standard costing) are less applicable.

Source: Orry J. Fiume. "Management Accounting for Lean Businesses." LEC.

Appendix C

SEC Roadmap

Assuming that the SEC determines in 2011 to incorporate IFRS into the US domestic reporting system, a possible timeline may unfold as follows:



* Staggered adoption possible based on earliest adoption in 2015 or 2016

Key dates

February 2010:	SEC issues statement in support of convergence and global accounting standards, inclusive of work plan
2011:	Target date for completion of FASB / IASB convergence agenda
2011:	Proposed SEC decision on IFRS
2012 - 2015:	Possible effective dates of converged standards
2012 - 2014:	Possible early adoption period
2013 - 2014:	Earliest comparative information required, assuming 2015 beginning adoption date
January 1, 2015:	Possible beginning adoption date
2015 - 2018:	Possible staggered adoption period

Source: “IFRS Reporting: Current situation and next steps." PwC US.

Appendix D

Jean Cunningham Case Studies

CAPITAL EQUIPMENT MANUFACTURER: A single-location private company initially closed the books on an unpredictable schedule between 18-20 days. Over a period of nine months this was reduced to 5 days. Then, post-implementation of an ERP system reduced it to 3 days. With further kaizen activity, this accounting team achieved regular 1-day closes for every month of the year except year-end for over six years. The key improvements included correction reduction, accuracy versus precision, and minimizing manual intervention. CONTRACT

MANUFACTURER: One of largest sites at this global enterprise of more than 50 locations was consistently late with submissions while expending significant efforts and incurring overtime. Kaizen activity resulted in a 67% reduction in processing time and a 95% reduction in wait time. The closing process was dramatically reduced and all overtime was eliminated. The site became the benchmark for “best in class” and catalyzed significant change across the entire company.

BUILDING MATERIALS MANUFACTURER: A single-location, private equity-owned company reduced the closing calendar from 10 days to 5 days with just one kaizen and eventually to 3 days. The key improvements were establishing the use of standard work, coordination of efforts by team members, and the elimination on non-value add steps during the closing window.

CAPITAL EQUIPMENT MANUFACTURER: This division of a multi-division company was able to reduce the time-to-close for the cost accounting function by 50% with one kaizen. The main improvements included gaining voice of the customer (VOC) input, reducing non-value add reports, and eliminating redundant recordkeeping and correction. PACKAGING

MATERIALS MANUFACTURER: A company with over 50 locations reduced the time required for corporate reporting which freed up the plant controllers to provide plant analysis and consulting. During one kaizen, over 11,000 touch points were eliminated (reports x locations x frequency). Key improvements included voice of the customer, eliminating redundant reports, and creating standard work instructions. Implementation across all locations took less than 3 months.

Source: Jean Cunningham. "Lean Accounting." JCC - Lean Business Processes.

Appendix E

Expense Classification Options under IFRS

IFRS Taxonomy 2008

[320000] Consolidated income statement, by nature of expense	
Separate income statement, by nature	
Profit (loss)	
Revenue	X
Other income	X
Changes in inventories of finished goods and work in progress	(X)
Work performed by entity and capitalised	X
Raw materials and consumables used	(X)
Employee benefits expense	(X)
Depreciation and amortisation expense	(X)
Impairment reversal (loss) recognised in profit or loss	(X)
Other expense	(X)
Other gains (losses)	X
Finance costs	(X)
Share of profit (loss) of associates and joint ventures accounted for using equity method	X
Profit (loss) before tax	X
Income tax expense	(X)
Profit (loss) from continuing operations	X
Profit (loss) from discontinued operations	X
Profit (loss)	X
Profit (loss), attributable to	
Profit (loss), attributable to owners of parent	X
Profit (loss), attributable to non-controlling interests	X
Earnings per share	
Basic earnings per share	
Basic earnings (loss) per share from continuing operations	X.XX
Basic earnings (loss) per share from discontinued operations	X.XX
Basic earnings (loss) per share	X.XX
Diluted earnings per share	
Diluted earnings (loss) per share from continuing operations	X.XX
Diluted earnings (loss) per share from discontinued operations	X.XX
Diluted earnings (loss) per share	X.XX

Source: IASB. "IFRS Taxonomy 2008."

[310000] Consolidated income statement, by function of expense	
Separate income statement, by function	
Profit (loss)	
Revenue	X
Cost of sales	(X)
Gross profit	X
Other income	X
Distribution costs	(X)
Administrative expense	(X)
Other expense	(X)
Other gains (losses)	X
Finance costs	(X)
Share of profit (loss) of associates and joint ventures accounted for using equity method	X
Profit (loss) before tax	X
Income tax expense	(X)
Profit (loss) from continuing operations	X
Profit (loss) from discontinued operations	X
Profit (loss)	X
Profit (loss), attributable to	
Profit (loss), attributable to owners of parent	X
Profit (loss), attributable to non-controlling interests	X
Earnings per share	
Basic earnings per share	
Basic earnings (loss) per share from continuing operations	X.XX
Basic earnings (loss) per share from discontinued operations	X.XX
Basic earnings (loss) per share	X.XX
Diluted earnings per share	
Diluted earnings (loss) per share from continuing operations	X.XX
Diluted earnings (loss) per share from discontinued operations	X.XX
Diluted earnings (loss) per share	X.XX

Source: IASB. "IFRS Taxonomy 2008."

ACADEMIC VITA

Campus Address:
229 I. Alley
State College, PA 16801
(610) 715-0965

Alexandra Rae Klebe

ark5128@psu.edu

Permanent Address:
1552 Morgan Lane
Wayne, PA 19087

EDUCATION:

The Pennsylvania State University**,** University Park, PA
Schreyer Honors College
Bachelor of Science in Accounting
Minor in Information Systems Management

RESEARCH:

Honors Thesis: IFRS Adoption in a Leaning Corporation: A Study of the Effects of IFRS on General Electric Transportation Company
Thesis Supervisor: Karl A. Muller
Honors Adviser: Orie Barron

WORK EXPERIENCE:

General Electric Transportation, Erie, PA 6/2009-8/2009
6/2010-8/2010

Financial Management Program Intern

- Developed an interactive volume sensitivity model for international joint venture deal
- Utilized economic benchmarks and regression analysis to improve upon locomotive price forecasting
- Created an organized method to accurately track expenses for international contracts
- Networked with upper-level managers and executives to understand the workings of a large organization
- Accepted full-time offer, commencing July 2011

Ultra Seal Inc., West Chester, PA 6/2005-9/2007
Assistant Office Manager

- Scheduled employee appointments with customers to initiate business relations
- Simplified the worker schedules into easy-to-use Excel spreadsheets
- Reviewed project estimates and worker schedules for correctness
- Entered contract estimate data into central database
- Directly responsible for suppressing customer complaints

HONORS:

Dean's List all semesters at Penn State University
Penn State President's Freshman Award, 2007

Selected to give speech on behalf of the Schreyer Honor College to 200+ guests at the *For the Future* Scholarship Campaign luncheon and the Renaissance Fund Dinner, 2009

USCSA First Team Academic All-American, Penn State Ski Team, 2007-2010

ACTIVITIES:

Penn State Ski Team, 2007- Present

- Competed in USCSA National Championships and earned 1st Team All-American
- THON Team: Went on canning trips to earn money for cancer patients

St John's Presbyterian Church Mission Trip Member

- *2005- Juarez, Mexico:* Built bathrooms for community
- *2005- Mohawk Reservation, NY:* Repaired homes on reservation and organized bible study
- *2007- Washington D.C.:* Ran soup kitchens and spoke to State Rep about homeless problem