

**Overcoming Alienation in the Automobile Industry:  
A Survey of Applied Methods For Job Enrichment**

Submitted in Partial Fulfillment of the Requirements for Graduation with Honors from  
the Department of International Relations, Carroll College, Helena, MT

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April 8, 2002

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## **Thesis Abstract**

Through the evolution of specialization in the automobile industry, production has become much more efficient but it has a major drawback: worker alienation. This thesis will trace the increasing trend of alienation through the evolution of specialization within the automobile industry, including a study of the division of labor, the introduction of the assembly line and its implications for mass production, as well as the recent emergence of lean production. Alienation is expressed in lack of job contentment which leads to increased turnover and absenteeism rates, as well as an increased chance of mental illness. A solution for alienation was found in the implementation of job enrichment; particularly through sociotechnological systems design approaches. To explore effective and ineffective methods of job enrichment, six case studies of automobile manufacturing sites are examined, as well as reasons traditional plants choose not employ these programs.

## Introduction

Through the evolution of specialization in the automobile industry production has become much more efficient but this efficiency has had a major drawback: worker alienation. Alienation is expressed in lack of job contentment which leads to increased turnover and absenteeism rates, as well as an increased chance of mental illness. Studies have shown that in recent years these rates have been extremely high, which has prompted certain automobile manufacturers to implement varying degrees of job enrichment to increase satisfaction of assembly line workers and thwart the negative effects of alienation.

GM-Saab and Volvo have experimented with different levels of job enrichment throughout select plants in Sweden, including Malmo, Trollhattan, Uddevalla, and Kalmar, with the objective of lowering turnover and absenteeism rates. Additionally, in the United States, Saturn (a wholly owned subsidiary of GM) attempted to learn from the programs of Sweden and employ its own unique techniques of job enrichment with the goal of maintaining low levels of turnover and absenteeism while being a globally competitive producer. Also in the US, a joint-venture between Toyota and GM resulted in the New United Motor Manufacturing, Inc. This plant employed a mixture of job enrichment programs for the Japanese method of lean production with the purpose of discerning if Japanese practices and philosophies for efficient production would be accepted in the United States.

All companies view the experiments as worthwhile ventures; although, not all

were ultimately successful. However, the culmination of these case studies indicates that indeed job enrichment programs do minimize alienation in automobile manufacturing plants. Therefore, the question remains: Why have these job enrichment techniques not been adopted across the industry?

In an attempt to find an answer, this thesis will first examine the evolution of specialization within the automobile industry, which will include a study of the division of labor, the introduction of the assembly line and its implications for mass production, as well as the recent emergence of the highly successful lean production. Then, an examination of automobile production will reveal an increasing trend of alienation, resulting in a labor force full of discontented workers and high rates of employee absenteeism and turnover. Next, potential solutions for alienation will be explored in a survey of job enrichment methods, particularly through sociotechnological systems design (STSD) approaches which attempt to balance the social and technological aspects of work life. Case studies of STSD programs implemented in Saab-GM, Volvo, Saturn and NUMMI automobile manufacturing sites revealed successes and failures but overall experiments had positive results.

Finally, reasons why job enrichment measures have not been implemented across the industry will be examined. At the risk of oversimplifying, it boils down to three main reasons: competition, capital, and cultural barriers. A conclusion will bring together main points of the paper, as well as make an educated assessment of complicating factors in the projects and a proposition of what the future holds for automobile manufacturers.

## **The Evolution of Specialization in the Automobile Industry**

This examination of the evolution of specialization within the automobile industry is a brief review of the period between 1770 and 2000. It begins with Adam Smith's assessment of the division of labor and factors which led to alienation in this sector of the economy. Then, a glance at the creation of the assembly line, interchangeable parts, and mass production will reveal the increased efficiency of specialization as well as increased feelings of alienation among workers. Finally, an evaluation of lean production in the automobile industry will reveal Japan's worldwide competitive edge in the production of motor vehicles, often at the sacrifice of quality of work life for plant workers.

### **The Division of Labor and Alienation**

Although industrial firms are diverse, most strive for improved methods of production to increase efficiency. One cause of greater efficiency has been the move from individual craftsmen to a factory of workers. It has been proven that a factory is able to produce goods more quickly and with greater economies of scale than the individual. An eighteenth century classical economist explained the reason for this inequality.

In 1776 Adam Smith, a British economist, wrote about specialization within production. His book, The Wealth of Nations, is the basis of modern economic thought.<sup>1</sup> Unlike other economists of his time, Adam Smith believed that the overall wealth of a nation was not derived from its land, but from its inhabitants. Labor was considered the

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<sup>1</sup> Robert J. Carbaugh, *International Economics*. 7<sup>th</sup> ed. (Cincinnati: South-Western College Publishing, 2000).

standard for value and therefore, specialization was the most profitable venue. Smith used the example of pin making, "One man draws out the wire, another straightens it, a third cuts it, a fourth points it . . . and the important business of making a pin is, in this manner, divided into about eighteen distinct operations."<sup>2</sup> The argument was made that the pin-maker alone could make one pin a day, but with the division of the trade into numerous departments, output could be multiplied by the thousands. Through division of labor, a great increase in production could be expected due to the increased skill of each workman in specialized areas, saved time commonly lost while passing from one type of work to another, and the invention of machinery replacing hand labor.

In fact, Smith believed that the workman came to know his area so well that he was able to create methods to increase efficiency and therefore, specialization was credited as the basis for many improvements in an industry. With a specific task delegated to only one worker, heightened productivity is achieved as well as technological advancement. Smith believed that it is this division which allows the wealth of nations and individuals to develop.<sup>3</sup>

Another key figure in the development of the division of labor was Frederick Winslow Taylor. He lived and worked in the United States until his death in 1915. While he worked as a common laborer and machinist, he studied manufacturing conditions and methods. As a result, he became an efficiency engineer and initiated scientific management in the United States and eventually penned Principals of Scientific

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<sup>2</sup> Adam Smith, *The Wealth of Nations*. (New York: Modern Library, 1937).

<sup>3</sup> Jerry Z. Muller, *Adam Smith - In His Time and Ours*. (Princeton: Free Press, 1993).

Management in 1911, which was quickly translated into ten other languages.<sup>4</sup>

His major feat was to develop ways to study the time and motions required for a worker to perform a task and then train the worker to use the most efficient method, resulting in significant increases in output. This concept that has become known as “Taylorism” was a “systematic way of thinking about the organization of production by a new, rapidly growing group of professionals: the engineers.”<sup>5</sup>

Taylor’s system had a definitive line between white and blue-collar workers. It was a system in which management delegated tasks and decided on the standard for a “fair day’s work” while the shop floor workers had no input. These blue-collar workers were selected using a scientific method which only seems appropriate considering Taylor’s research emphasis. Potential employees were tested to ensure that the skills possessed were just apt enough for the job they were hired to accomplish.<sup>6</sup> This philosophy stated that a hierarchical management system was necessary as managers analyzed the blue-collared worker’s tasks and decided upon a greater level of production for the worker to achieve.<sup>7</sup> Taylor declared management’s role as “the burden of gathering together all of the traditional knowledge which in the past has been possessed by the workmen and then of classifying, tabulating and reducing this knowledge to rules, laws and formulae” to ultimately improve the processes in daily work.<sup>8</sup>

Taylorism has suffered much criticism through the years because it was not

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<sup>4</sup> JoAnn Greco, “Strategists of the Century,” *Journal of Business Strategy*, vol. 20, No. 5 (1999), p. 27.

<sup>5</sup> Ben Dankbaar, “Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?” *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>6</sup> Ben Dankbaar, “Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?” *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>7</sup> JoAnn Greco, “Strategists of the Century,” *Journal of Business Strategy*, vol. 20, No. 5 (1999), p. 27.

sensitive to the physical and psychological needs of working people. Taylor's scientific methodology for achieving the greatest efficiency left little room for such job enriching aspects as task variety, autonomy and feedback.<sup>9</sup> Consider the information presented above concerning the roles of the manager and the laborer. The manager's position entailed mandating tasks to the laborer and researching methods to improve efficiency which left the worker in a dehumanized position in which the "system must be first."<sup>10</sup> In fact, the efficiency Taylor created has been described as one that "melds man with machine, often to man's disadvantage."<sup>11</sup> It is not difficult to understand this perspective taking into account that under this system management became even more empowered to mandate a maximized output and the common laborer was further removed from a decision making position which led to a feeling of helplessness at work, a sign of alienation.<sup>12</sup>

### **The Assembly Line**

In the late 1790s Eli Whitney, best remembered as the inventor of the cotton gin, also developed the concept of mass production of interchangeable parts and the assembly line. His ingenuity became invaluable in the movement from an agrarian economy to an industrial economy.<sup>13</sup>

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<sup>8</sup> Thomas L. Robinson, "Revisiting the Original Management Primer," *Industrial Management*, vol. 34, No. 1 (January-February, 1992), pp. 19-21.

<sup>9</sup> Ben Dankbaar, "Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?" *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>10</sup> Ann Harrington. "The Big Ideas: Ever Since Frederick Taylor Pulled Out His Stopwatch, Big Thinkers Have Been Coming Up With New – Though Not Always Better – Ways to Manage People and Business," *Fortune*, vol. 140, No. 10 (November, 1999), p. 152.

<sup>11</sup> JoAnn Greco, "Strategists of the Century," *Journal of Business Strategy*, vol. 20, No. 5 (1999), p. 27.

<sup>12</sup> Thomas L. Robinson, "Revisiting the Original Management Primer," *Industrial Management*, vol. 34, No.1 (January-February, 1992), pp. 19-21.

<sup>13</sup> H.W. Brands, *The United States in the World*. (Boston: Houghton Mifflin, 1994).

Whitney found a method of increasing productivity by combining Smith's efficient ideas for the division of labor with the use of multiple interchangeable parts. However, this worked only if the component parts were essentially identical and therefore, interchangeable. The element that made the assembly line system so efficient was the conveyer belt, a moving device on which products were assembled. As the belt moved along, it had timed short stops for parts to be added or various operations performed. Whitney found that Smith's declaration that time was saved when employees did not have to move around to other tasks was correct and it was one factor increasing efficiency.<sup>14</sup>

### **Mass Production**

Another popular example of specialization was utilized by Henry Ford of Ford Motor Company. In 1913 he invested approximately \$3,500 to construct and install a conveyer belt for the Ford auto plant.<sup>15</sup> Ford's well known saying concerning the classic Model T that "the customer could have a car in any color, as long as it was black" demonstrates the theme of mass production.<sup>16</sup> He took Taylor's process a couple steps further in having machines set the pace of production which resulted in management's ability to decide daily output. Through the use of division of labor and mechanization, mass production for a complex product became viable in an automotive assembly line.<sup>17</sup>

Ford's continuously moving line resulted in a decrease in manufacturing time by

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<sup>14</sup> Daniel A. Wren, & Greenwood, Ronald G., "Business Leaders: A Historical Sketch of Eli Whitney," *Journal of Leadership Studies* (Winter-Spring, 1999). p.128.

<sup>15</sup> Drew Winter, "The Mass Production Revolution: Forget the Machine: "The Line" Changed the World," *Ward's Auto World*, vol. 32, No. 5 (May, 1996), p. 101.

<sup>16</sup> JoAnn Greco, "Strategists of the Century," *Journal of Business Strategy*, vol. 20, No. 5 (1999), p. 27.

<sup>17</sup> Ben Dankbaar, "Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems

87% and an increase in wages by nearly 100%. The dramatic increase in efficiency and savings of labor costs allowed Ford to pay workers \$5 per day and cut average daily hours from ten to eight which he claimed to do for the betterment of mankind.<sup>18</sup> To demonstrate the immensity of Ford's contribution to manufacturing, consider these statistics. In 1904, about 3,000 workers were employed by the automobile industry but by 1914, nearly 68,600 auto workers were employed in Michigan alone.<sup>19</sup> Also, in 1909 nearly 14,000 automobiles were manufactured at Ford but by 1914, production reached approximately 230,000 cars.<sup>20</sup> This equaled 78% of the total vehicle production in the United States.<sup>21</sup> As necessary work hours decreased, expenses and prices also dropped which enabled workers to be paid more and the product became financially feasible for a greater percentage of the overall population.<sup>22</sup> By the mid-1930s, nearly every automobile manufacturer utilized Ford's assembly line for mass production.<sup>23</sup>

Each assembly line was designed for a specific car; although, in comparison, there were only minor modifications between differing lines. Automobiles traveled along the line continuously and were worked on with standardized, interchangeable components. Each man was given only one short-cycle-time task, which he did repeatedly until it

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Design?" *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>18</sup> Drew Winter, "The Mass Production Revolution: Forget the Machine: "The Line" Changed the World," *Ward's Auto World*, vol. 32, No. 5 (May, 1996), p. 101; also see, Eric Pope, "Now About This Assembly Line . . .," *Crain's Detroit Business*, vol. 17, No. 27 (27 June 2001), p. 9.

<sup>19</sup> Drew Winter, "The Mass Production Revolution: Forget the Machine: "The Line" Changed the World," *Ward's Auto World*, vol. 32, No. 5 (May, 1996), p. 101.

<sup>20</sup> Ann Harrington. "The Big Ideas: Ever Since Frederick Taylor Pulled Out His Stopwatch, Big Thinkers Have Been Coming Up With New – Though Not Always Better – Ways to Manage People and Business," *Fortune*, vol. 140, No. 10 (November, 1999), p. 152.

<sup>21</sup> Drew Winter, "The Mass Production Revolution: Forget the Machine: "The Line" Changed the World," *Ward's Auto World*, vol. 32, No. 5 (May, 1996), p. 101.

<sup>22</sup> JoAnn Greco, "Strategists of the Century," *Journal of Business Strategy*, vol. 20, No. 5 (1999), p. 27.

<sup>23</sup> David Bennett & Ulf Karlsson. *Journal of Management*. (New York: M.E. Sharpe Inc., 1993).

became automatic and he became specialized in the particular skills needed for productive efficiency.<sup>24</sup> Henry Ford himself illustrated the process, “the man who places a part does not fasten it — the part may not be fully in place until after several operations later. The man who puts in a bolt does not put on the nut . . . every piece of work in the shop moves.”<sup>25</sup>

Major benefits of mass production included economies of scale and a large labor force. Economies of scale occurred as increased amounts of products were manufactured which spread the expenses over all units resulting in a decrease in per unit cost. Although this cut unnecessary expenditures, it did result in large stockpiles of parts that had to be stored which was also wasteful.<sup>26</sup> Eventually, Ford implemented a just-in-time inventory procedure and to reduce the need for storage, he would send a greater quantity of automobiles to dealerships.<sup>27</sup> Employers of mass production usually offered employment to the unskilled or semi-skilled workers because the parts were fitted which made costly mistakes unlikely. A large labor force was easily filled with manual laborers. Few skilled employees were needed but they occupied such positions as supervisor or operation function planner.<sup>28</sup>

One downfall of mass production was that quantity was more important than quality. For example, if a defective part came down the line, workers would either use the defective component or simply leave it out. As a consequence, a team of

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<sup>24</sup> Ben Dankbaar, “Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?” *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>25</sup> David Bennett & Ulf Karlsson. *Journal of Management*. (New York: M.E. Sharpe Inc., 1993).

<sup>26</sup> Ben Dankbaar, “Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?” *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>27</sup> JoAnn Greco, “Strategists of the Century,” *Journal of Business Strategy*, vol. 20, No. 5 (1999), p. 27.

postproduction quality repair specialists examined vehicles and (hopefully) made all the necessary changes.<sup>29</sup> Another weakness of this system was that many workers felt “as interchangeable as the parts of his cars” which resulted in extremely high turnover and feelings of alienation. Ford offered such high wages only to entice new workers to man his lines. With booming sales, this was easily affordable.<sup>30</sup>

### **Lean Production**

Lean production is a form of flexible manufacturing technologies that originated in Japan during the 1950s and 1960s.<sup>31</sup> However, it was not mastered until the 1990s.<sup>32</sup> This concept first emerged at Toyota and has spread across the country’s commercial lines. It has been named “an intensification and qualitative improvement of traditional assembly-line production.”<sup>33</sup> Compared to mass production, lean production is said to require half as much human effort, manufacturing space, investment tools, engineering hours, and time to develop new products. In the lean production plants, firms are able to combine craftsmanship with mass production but avoid respective high costs and inflexibility.<sup>34</sup> This production strategy is dependent upon efficiency with just-in-time

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<sup>28</sup> Ben Dankbaar, “Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?” *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>29</sup> Ben Dankbaar, “Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?” *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>30</sup> Drew Winter, “The Mass Production Revolution: Forget the Machine: “The Line” Changed the World,” *Ward’s Auto World*, vol. 32, No. 5 (May, 1996), p. 101.

<sup>31</sup> Lowell Turner, “Enriching Production,” *Industrial and Labor Relations Review*, vol. 50, No. 2 (January, 1997), pp. 359-361.

<sup>32</sup> J.P. Womack, D.T. Jones, & D. Roos, *The Machine that Changed the World*. (New York: HarperPerennial, 1990), p. 64.

<sup>33</sup> Lowell Turner, “Enriching Production,” *Industrial and Labor Relations Review*, vol. 50, No. 2 (January, 1997), pp. 359-361.

<sup>34</sup> Ben Dankbaar, “Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?” *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

demands, quick set up times, and small quantities of part produced.<sup>35</sup> Within this multi-skilled workforce, employees are trained in a variety of tasks and are encouraged to strive for continual efficiency improvement. In this system, all so-called buffers (such as stockpiles) have been eliminated to develop a continuous flow of production.<sup>36</sup> The company becomes more flexible and is better able to adapt to change.<sup>37</sup>

The practice of lean production began when Toyota engineers Ohno Taiichi and Eiji Toyoda found solutions to the flaws within the mass production system.<sup>38</sup> Not long after, Toyota became the most efficient automobile manufacturer in the world.<sup>39</sup> It was discovered that with the mass production system, too many vehicles were being produced which created a surplus in the supply and created a low priority view of quality. The extra inventory had to be stored in warehouses which was an unnecessary expenditure resulting from poor projections. In addition, workers simply put off self-imposed quality inspections because they knew that units would be inspected later anyway. Finally, it was found that the mass production system was unable to cater to the diverse tastes of consumers.<sup>40</sup> This was especially important because Japan's culture prides itself on excellent customer service and quality which entails meeting the consumers' needs.<sup>41</sup>

In the process of lean production, unlike mass production, a defective product can

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<sup>35</sup> J.P. Womack, D.T. Jones, & D. Roos, *The Machine that Changed the World*. (New York: HarperPerennial, 1990).

<sup>36</sup> Ben Dankbaar, "Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?" *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>37</sup> Drew Winter, "The Mass Production Revolution: Forget the Machine: "The Line" Changed the World," *Ward's Auto World*, vol. 32, No. 5 (May, 1996), p. 101.

<sup>38</sup> Drew Winter, "The Mass Production Revolution: Forget the Machine: "The Line" Changed the World," *Ward's Auto World*, vol. 32, No. 5 (May, 1996), p. 101.

<sup>39</sup> Charles W. L. Hill, *International Business*. 3<sup>rd</sup> ed. (Boston: McGraw-Hill, 2002), pp. 508 – 9.

<sup>40</sup> Charles W. L. Hill, *International Business*. 3<sup>rd</sup> ed. (Boston: McGraw-Hill, 2002), pp. 508 – 9.

<sup>41</sup> Carroll College International Business BA 392. Japanese Series.

completely stop all operations because line workers are responsible for quality. Defects result in disrupted work as the entire cycle depends upon a just-in-time strategy for parts and workers must wait for replacements to arrive. Workers are able to check for quality with statistical devices or sampling methods.<sup>42</sup> Taiichi and Toyoda also found that the system of mass production was vulnerable to immense amounts of waste if initial settings on machines were incorrect. This flexible manufacturing technology is geared toward “reducing setup times for complex equipment, increasing utilization of individual machines through better scheduling, and improving quality control at all stages of the manufacturing process.”<sup>43</sup> This increased efficiency with scheduling and quality has allowed a greater quantity to be produced while still producing differentiated products. By achieving these objectives in lean production, a new form of mass production has been born: mass customization. Mass customization allows firms to produce goods to suit the tastes and preferences of consumers without losing on economies of scale normally found in the mass production of standardized products.<sup>44</sup>

However, lean production has been under scrutiny the past few years, especially by the Japan Auto Workers Union. One aspect of lean production that has been controversial is the elimination of buffer stocks, such as extra inventory stored in the event of lower output than expected. The problem with this is that if output does not reach a desired level during the normal shift, workers’ use their personal time as the buffer to make up for production lost. This results in employee exhaustion and average

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<sup>42</sup> Ben Dankbaar, “Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?” *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>43</sup> Charles W. L. Hill, *International Business*. 3<sup>rd</sup> ed. (Boston: McGraw-Hill, 2002), pp. 508-9.

<sup>44</sup> Charles W. L. Hill, *International Business*. 3<sup>rd</sup> ed. (Boston: McGraw-Hill, 2002), pp. 508 –9.

workweeks of about fifty hours. Unionists view this new method of production as a way to place undue pressure on the worker to “intensify the work effort,” and it appears to strengthen management control while pushing the union out.<sup>45</sup>

Throughout the evolution of specialization, one trend among autoworkers has continually paralleled the increasing efficiency within manufacturing plants; it is a concept known as alienation. This movement became evident as workers increasingly became dissatisfied with their jobs manifested through climbing percentages of turnover and absenteeism. Consequently, firms experienced increased expenditures and greater levels of lost profits; thus leading to a study of alienation.

### **Alienation in Automobile Assembly Line Workers**

Karl Marx was one of the first philosophers to expound upon the theory of alienation. His literary work Economic and Philosophical Manuscripts was first published in 1844 and it is credited with the insight “not to isolate man’s alienation from economic conditions and trends but to trace alienation to the basic structure and development of capitalist society.”<sup>46</sup> A more extensive collaboration of his thoughts was compiled within the Communist Manifesto in 1848. Both works decried the popular capitalist system as being an “economic system that rewarded greed and penalized humanitarianism.”<sup>47</sup> Marx identified alienation as a result of dehumanized specialization pursued within the capitalist system.

Alienation is intrinsic to monotonous and repetitive divisions of work and it has become more of an issue in the workplace with changing demographics. As individuals

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<sup>45</sup> “Steering the Middle Road to Car Production,” *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

<sup>46</sup> Fritz Pappenheim, “Alienation in American Society,” *Monthly Review*, vol. 52, No. 2 (2000), p. 36.

become increasingly more educated over time, they develop attributes such as self-affirmation and democracy and it becomes increasingly harder to simply accept boring and dehumanized work.<sup>48</sup>

To characterize alienation, one must look at three different elements of this concept. First, it evokes a feeling of powerlessness in the employee relative to ownership of the firm, company policies, working conditions, and daily operations. Second, workers may see a lack of significance in the goods produced or methods of production. Third, personnel may isolate themselves from others within the firm's environment and company activities. These three aspects of alienation may be viewed in different and integrated phases: alienation from oneself, from fellow man, and from the world.<sup>49</sup>

Robert Blauner, an expert in the theory of alienation, stated:

Alienation exists when workers are unable to control their immediate work processes, to develop a sense of purpose and function which connects their jobs to the over-all organization of production, to belong to integrated industrial communities, and when they fail to become involved in the activity of work as a mode of personal self-expression.<sup>50</sup>

Alienation moved from a business interest to a human interest when the components of alienation were evident in employee performance. Specifically, mental illnesses, turnover and absenteeism rates have increased among assembly line workers, especially within the automobile industry. In fact, in a study of "407 autoworkers, approximately 40% had some symptoms of mental health problems, and the key correlation was between job

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<sup>47</sup> Brands, H.W., *The United States in the World*. (Boston: Houghton Mifflin, 1994), 153 – 5.

<sup>48</sup> James O'Toole (Chairman), *Work in America*. (London: MIT, 1973), p. 22.

<sup>49</sup> Fritz Pappenheim, "Alienation in American Society," *Monthly Review*, vol. 52, No. 2 (2000), p. 36.

<sup>50</sup> Robert Blauner, *Alienation and Freedom; The Factory Worker and His Industry*. (Chicago: University of Chicago Press, 1964).

satisfaction and poor mental health.”<sup>51</sup> In this case, mental health was defined as depression, hopelessness or impaired interpersonal communication, not as a serious mental disease, such as schizophrenia. Of these workers, it was discovered that those with the lowest scores for employee satisfaction estranged themselves from co-workers and community functions.<sup>52</sup>

Additionally, an astounding 50% believed that “they had little control over the future course of their lives” and found actions such as voting pointless.<sup>53</sup> As workers became bored with their jobs and gave up on task significance, employee turnover and absenteeism rates skyrocketed. For example, “In 1979, the entire Volvo organization experienced a labor turnover of 12%, up 4% over 1978.”<sup>54</sup> This was especially true in the automobile industry and it caused the management of a manufacturing warehouse to finally notice that there was a problem that desperately needed a solution. Additionally, absenteeism rates also increased by a significant margin. In 1973 “some [automobile] plants, report absenteeism as high as 13% compared to 3%” only a few years earlier.<sup>55</sup> Ignoring extenuating circumstances, car companies were forced to find a resolution to alienation in the work force as operations were disrupted and profits decreased as a result of employee morale. The answer appeared to be simple; although, its application would be quite complex: job enrichment.

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<sup>51</sup> James O’Toole (Chairman), *Work in America*. (London: MIT, 1973), p. 83.

<sup>52</sup> James O’Toole (Chairman), *Work in America*. (London: MIT, 1973), p. 83.

<sup>53</sup> James O’Toole (Chairman), *Work in America*. (London: MIT, 1973), p. 83.

<sup>54</sup> H.G. Jones, “Group Working at Volvo Olofstrom,” *Futures Guildford*, (February, 1981).

<sup>55</sup> Charles H.Gibson, “Volvo Increases Productivity through Job-Enrichment,” *California Management Review*, vol. 15, No. 4 (1973), p. 64.

## Job Enrichment

Job enrichment is the restructuring of the duties or processes involved in a position of employment and improvement of the quality of work life. It involves changing the job to tap into the potential of workers through challenging them within their current position, often with employee empowerment or personal autonomy.<sup>56</sup>

Employee empowerment is “the process of giving people more power to exercise control over and take responsibility for their work” and it allows individuals to utilize their knowledge and skills in making decisions.<sup>57</sup> Duties can be adapted through task variety, task significance, job identity, autonomy and feedback.

In the 1960s and 1970s, a form of job enrichment became popular in Europe and North America. This was named the sociotechnological systems design (STSD) approach to ease discontent among workers. Absenteeism, high turnover rates, and poor quality became apparent forms of protest to the quality of work life, or lack thereof. STSD introduced the idea of semi-autonomous work groups to balance the social and technological elements of manufacturing. Preparation, execution, and control were delegated to the lowest levels of the firm whenever possible and organizational solutions were sought over technological ones. Expected results were to obtain a more democratized and humane work environment while increasing efficiency, a presumed byproduct of increased work force satisfaction. With this method of job redesign, those who experimented with STSD strove to eliminate the short-cycled work of Ford’s

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<sup>56</sup> Beverly Kaye & Sharon Jordan-Evans, *Love 'Em or Lose 'Em: Getting Good People to Stay*. (New York: Berrett-Koehler Publishers, 2000).

<sup>57</sup> Roisin Ingle, “Giving People the Power to Exercise Control,” *The Irish Times*, 14 December 1998.

assembly line.<sup>58</sup>

Although a bit dated, research conducted under the Auspices of the W.E. Upjohn Institute for Employment Research found several examples of the positive effects of job enrichment. One such instance occurred in 1967 when Texas Instruments conducted an experiment with its cleaning services. Normally, the institute contracted for its cleaning services but found that the building was only about 65% clean after the cleaning services were finished. Inquiries into the cleaning firm revealed that due to alienation in the work place, quarterly turnover rates were at 100% which inhibited the firm's ability to do a job well, as new employees were being trained all the time.<sup>59</sup> Texas Instruments implemented four main applications of job enrichment to see the effects on the cleaning staff. These included:

1. Cleaning service teams of nineteen people were organized and were given a voice in the planning, problem solving, and goal setting for their own jobs.
2. They were thoroughly trained in the job requirements and techniques, and were provided with adequate equipment to do the job.
3. They were held accountable for the overall job. The means of getting the job done was left to them.
4. They were taught how to measure their own performance and were given the freedom to do so, both as individuals and as teams.<sup>60</sup>

The results clearly indicated that feelings of alienation dissipated by enriching the quality of work life through task variety, task significance, job identity, autonomy and feedback. First, the rate of cleanliness was improved by 20% and the personnel necessary to do the entire job was pruned from 120 to 71 employees. Even more impressive, quarterly turnover plummeted from 100% to only 9.8%. Finally, over the next two years,

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<sup>58</sup> Ben Dankbaar, "Lean Production: Denial, Confirmation or Extension of Sociotechnical Systems Design?" *Human Relations*, vol. 50, No. 5 (May, 1997), pp. 567 – 583.

<sup>59</sup> James O'Toole (Chairman), *Work in America*. (London: MIT, 1973), pp. 100 – 101.

Texas Instruments saved \$206,000 in expenditures for cleaning services. Obviously, efforts to improve the quality of the job were worthwhile. Not only was the plant cleaner and unnecessary expenditures eliminated, but also the decrease in employee turnover and absenteeism clearly reflected the extent to which worker satisfaction increased.<sup>61</sup> The positive results of this experiment and others like it gained the attention of industries with severe alienation problems, such as the automobile sector.

Job enrichment was sorely needed in the manufacturing plants of the automobile industry in Sweden. In addition to the monotony of the assembly line, cultural aspects encouraged worker alienation to the point that Saab-GM and Volvo, Sweden's only two domestic car producers, could not avoid the problem any longer.<sup>62</sup> The country is a welfare state; it aims for full employment and has institutionalized liberal social welfare benefits which are funded by an income tax range of 35% to 72% of gross income.<sup>63</sup> As a result, higher pay does not always serve as sufficient inspiration of loyalty to one's workplace.<sup>64</sup>

Also, these taxes are used to pay for such privileges as hospital care and college tuition which are "free" to Swedish citizens and unemployment benefits can reach 90% of the previous year's wages.<sup>65</sup> The country is highly educated which, as previously stated, relates to such characteristics as self-affirmation and confidence. Consequently, "the

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<sup>60</sup> James O'Toole (Chairman), *Work in America*. (London: MIT, 1973), pp. 100 – 101.

<sup>61</sup> James O'Toole (Chairman), *Work in America*. (London: MIT, 1973), pp. 100 – 101.

<sup>62</sup> David Bennett & Ulf Karlsson. *Journal of Management*. (New York: M.E. Sharpe Inc., 1993).

<sup>63</sup> Robert F. Huber, "Sweden: The Good Life, With Challenges," *Production*, vol. 103, No. 1 (January, 1991), pp. 60-63.

<sup>64</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*, (28 August 1989).

<sup>65</sup> Robert F. Huber, "Sweden: The Good Life, With Challenges," *Production*, vol. 103, No. 1 (January, 1991), pp. 60- 63.

country's highly educated, well-trained labor force doesn't like to work in factories."<sup>66</sup> Therefore, a solution to extremely high absenteeism and turnover rates was desperately needed. Volvo's Swedish plants had a 20% to 30% absenteeism rate daily and about one-third of plant workers quit yearly.<sup>67</sup> The capital expenditures for training and recruitment alone amounted to a sizable sum, not to mention the inconsistent levels of output resulting from absent workers. Saab-GM and Volvo decided that it was worthwhile to institute varying degrees of job enrichment within plants as an experimental solution to the problems faced in the Swedish automobile manufacturing plants.

From previous smaller scale studies, such as the experiment at Texas Instruments, Saab-GM and Volvo had reason to believe that implementing job enrichment elements would result in a decreased feeling of alienation. Potential benefits to a successful job enrichment program would include increased job satisfaction among workers, lower turnover and absenteeism rates, and a better level of quality in the products manufactured. Feelings of boredom, depression, and powerlessness were likely to be replaced with satisfaction and pride for one's own work. Thus, increasing motivation to be productive and become more involved in employment and local activities.<sup>68</sup>

An aftereffect of increased worker satisfaction is a lower turnover rate. During this period, the turnover rate at Saab-GM and Volvo was nearly one-third yearly.<sup>69</sup> If this rate could be decreased, it would result in less money spent for recruitment and hiring

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<sup>66</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line?'" *Business Week*, (28 August 1989).

<sup>67</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991); also see, Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line?'" *Business Week*, (28 August 1989).

<sup>68</sup> James O'Toole (Chairman), *Work in America*. (London: MIT, 1973), pp. 100 – 101.

purposes. Swedish manufacturers believed that with increased job contentment, the absenteeism rate would also decrease from the national industrial standard of 20% to 30%.<sup>70</sup> Over the long run, this could save on payouts for sick leave compensations and could result in more consistent levels of output.

Finally, it was believed that overall product quality would be greatly improved by job enrichment programs. Just as the cleanliness level rose to 85% at Texas Instruments, car manufacturers believed that workers would develop a sort of personal pride in the final product and therefore, pay more attention to detail and strive for excellence. In fact, the president of Volvo desired workers to see a Volvo driving down the street and feel a sense of accomplishment, pride, and identity with the final product of their labors.<sup>71</sup>

Additionally, with greater emphasis placed on quality, there should be fewer post-production mistakes to fix.

With all these factors considered, Saab-GM and Volvo selected manufacturing sites to begin the implementation of job enrichment, seeking a solution to the tribulations of alienation in the industry.

### Case Studies

As noted above, beginning in the mid-1960s, Swedish automobile manufacturers implemented revolutionary programs within production sites in hopes of decreasing

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<sup>69</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*, (28 August 1989).

<sup>70</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*, (28 August 1989).

<sup>71</sup> Pehr Gyllenhammar, "Volvo's Solution to the Blue Collar Blues," *Business and Society Review*, vol. 7 (Fall, 1973).

employee turnover and absenteeism while boosting employee morale. It was believed that in the long run, costs would be cut and quality improved. The most noteworthy experiments occurred in Sweden by Saab-GM and Volvo. Saab-GM sites included Trollhattan and Malmo while Volvo plants were in Uddevalla and Kalmar. By the mid 1980s and early 1990s, automobile manufacturers in the United States realized the need to follow the suit of Swedish producers and implement job enrichment to solve problems of alienation. Specifically, Saturn and the New United Motor Manufacturing, Inc. were opened with the intention of operating according to the needs of the modern business environment, for internal and external purposes. A study of each plant will reveal the changes implemented to increase job satisfaction and the available statistical results credited to these programs.

#### **Volvo: KALMAR**

In 1974, Volvo's first experimental site opened in Kalmar, Sweden. At Kalmar, semi-autonomous work teams were used, composed of fifteen to twenty members who were skilled in a variety of tasks and therefore had the luxury of job rotation. This expansion of task variety decreased boredom among workers which commonly accompanies specialization.<sup>72</sup> Time cycles spent on one automobile for each team was about thirty minutes, meaning that individuals would complete a particular task every half hour rather than continuously throughout the entire workday.<sup>73</sup>

Although the cars moved from one team to the next, this was anything but the

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<sup>72</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*, (28 August 1989).

<sup>73</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*, (28 August 1989).

traditional assembly line.<sup>74</sup> The Kalmar layout was a polygonal spread connected to a central warehouse for storage, with each team working in areas of the polygon.<sup>75</sup> The setup was an adaptation to the classic method of assembly; the independent but sequential “minilines” of production were created.<sup>76</sup> Workers had the autonomy to determine their own rate of work and length of breaks.<sup>77</sup>

After ten years of operation, Kalmar demonstrated evidence of a comparative advantage over conventional assembly lines. In switching from production of the 240 model to the 740, only 1.5 working days were lost which is more efficient than traditional sites. This is largely due to the flexibility incorporated into processes. Additionally, by 1984, average defects found were reduced by 39%.<sup>78</sup> However, Kalmar’s rate for absenteeism remained around 17% daily which was barely lower than the industrial average for Sweden.<sup>79</sup> In 1991, Kalmar could boast of a complete assembly time of thirty-seven hours and “twenty percent higher productivity than projected was achieved.”<sup>80</sup> By 1992, Kalmar exhibited the lowest assembly costs and the highest level of quality compared to other STSD sites in Sweden.<sup>81</sup> Unfortunately, due to a declining market, Kalmar closed by the summer of 1993.<sup>82</sup>

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<sup>74</sup> Jonathan Kapstein, “Volvo’s Radical New Plant: ‘The Death of the Assembly Line?’” *Business Week*, (28 August 1989).

<sup>75</sup> Gerarda Orleans, “Volvo Pulls the Plug On the Assembly Line,” *Business and Society Review*, vol. 22 (Summer, 1977).

<sup>76</sup> “Lessons from the Volvo Experience,” *International Management*, vol. 33, No. 2 (1978), p. 42.

<sup>77</sup> “Lessons from the Volvo Experience,” *International Management*, vol. 33, No. 2 (1978), p. 42.

<sup>78</sup> David Bennett & Ulf Karlsson. *Journal of Management*. (New York: M.E. Sharpe Inc., 1993).

<sup>79</sup> Jonathan Kapstein, “Volvo’s Radical New Plant: ‘The Death of the Assembly Line?’” *Business Week*, (28 August 1989).

<sup>80</sup> “The Myths of Volvo,” *New Management*, vol. 1, No. 2 (1983), p. 30.

<sup>81</sup> David Bennett & Ulf Karlsson. *Journal of Management*. (New York: M.E. Sharpe Inc., 1993).

## Saab-GM: Trollhattan

At one time, Trollhattan was Saab's plant for airplanes but was later redesigned to manufacture automobiles. Today, it is the main production site with a capacity of approximately 90,000 units per annum, totaling nearly 70% of Saab's entire output. However, in the mid 1970s and early 1980s it was not so efficient. In fact, the Trollhattan plant experienced annual turnover rates as high as 50% per year which was considerably above the industry standard. Additionally, absenteeism was continually increasing as line workers with "the equivalent of an engineering degree . . . [were] left idle, breeding boredom and indifference."<sup>83</sup>

As a result, a sociotechnological philosophy was implemented into corporate practices and culture. A Saab executive stated that, "the problem with traditional assembly concepts is that separate and repetitive tasks provide little responsibility, which leads to alienated and frustrated workers."<sup>84</sup> To deviate from the classic methods, employees were placed into small groups and were given multiple responsibilities which were integrated; it was found that this increased motivation. Also, as employees were allowed to set their own pace and a greater variety of tasks were distributed, turnover dropped from 50% to 15%. Task variety included maintenance, material planning, and work distribution. Additionally, absenteeism decreased while quality was enhanced.<sup>85</sup>

In 1989, the GM corporation bought 50% of Saab; thus, creating Saab Automobile

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<sup>82</sup> "Steering the Middle Road to Car Production," *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

<sup>83</sup> John McElroy, "Strolling through Trollhattan," *Automotive Industries*, vol. 166 (February, 1986), pp. 69-70.

<sup>84</sup> John McElroy, "Strolling through Trollhattan," *Automotive Industries*, vol. 166 (February, 1986), pp. 69-70.

<sup>85</sup> John McElroy, "Strolling through Trollhattan," *Automotive Industries*, vol. 166 (February, 1986), pp. 69-

AB. At that time, an average vehicle produced at a Saab plant would take 110 hours to complete and still received around 100 demerits for defects.<sup>86</sup> General Motors allied with Saab in hopes of corporate survival.<sup>87</sup> As a complement to the Saab's philosophy of sociotechnology, the QLE/H system was implemented in 1989. Respectively, high quality (Q), punctual delivery (L), economical cost (E), and employee involvement (H) were the four components in this new system.<sup>88</sup> Other noteworthy changes that brought dramatic results were the institution of mini lines and modular assembly.<sup>89</sup>

Prior to this alliance between GM and Saab, Saab had assembled vehicles in cells. This was modernized to a miniline system where the car and workers moved together in a unit for the duration of that part of the procedure. The automobile is suspended in air allowing adjustable ergonomics.<sup>90</sup> This new process is more efficient as it includes assemblage of components when needed, reduction of buffers, increased autonomy, and decreased hauling distances.<sup>91</sup>

Strategically, Saab-GM laid off more than 6,000 employees from the workforce and replaced 70% of its managers in 1992. At this time, a team concept was implemented with more power delegated to the group leaders and less management

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<sup>86</sup> Marjorie Sorge, "Saab Quiets the Storm," *Automotive Industries*, vol. 176, No. 2 (February, 1996), pp. 127 - 129.

<sup>87</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, 7 July 1991.

<sup>88</sup> Marjorie Sorge, "Saab Quiets the Storm," *Automotive Industries*, vol. 176, No. 2 (February, 1996), pp. 127 - 129.

<sup>89</sup> John McElroy, "Strolling through Trollhattan," *Automotive Industries*, vol. 166 (February, 1986), pp. 69-70.

<sup>90</sup> John McElroy, "Strolling through Trollhattan," *Automotive Industries*, vol. 166 (February, 1986), pp. 69-70.

<sup>91</sup> Marjorie Sorge, "Saab Quiets the Storm," *Automotive Industries*, vol. 176, No. 2 (February, 1996), pp. 127-129.

control. The teams were “highly focused on direct work.”<sup>92</sup>

By 1996, this process combined with ever-changing technology had resulted in 25% fewer parts needed and 27% faster production time at thirty-eight hours. As a result, the inventory turnover rate increased by 60%. Additional favorable results of this system were found in areas of productivity, financial efficiency and quality. A greater level of group work is credited with increased productivity of 30% to 100% (depending upon the particular line) and the increase in quality control allowed strategic layoffs from the repair facilities; thus improving the financial and productive efficiency of the entire plant. Quality increased by more than 70% as average demerits dropped to twenty-seven and absenteeism plummeted by 40%. Additionally, employees genuinely showed a growing interest in the firm which was confirmed when employee suggestions per year doubled in amount between 1989 and 1996.<sup>93</sup>

#### **Volvo: UDDEVALLA**

In 1986, work began on Volvo’s experimental site Personvagnar Uddevalla-verken AB in Sweden.<sup>94</sup> A union-management team jointly operated Uddevalla until it closed in 1993.<sup>95</sup> This site would have the most extensive job enrichment measures taken in the entire car industry, labeled the “craftsman approach.”<sup>96</sup> In an effort to increase

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<sup>92</sup> David Bennett & Ulf Karlsson. *Journal of Management*. (New York: M.E. Sharpe Inc., 1993).

<sup>93</sup> Marjorie Sorge, “Saab Quiets the Storm,” *Automotive Industries*, vol. 176, No. 2 (February, 1996), pp. 127-129.

<sup>94</sup> Robert F. Huber, “Sweden: The Good Life, With Challenges,” *Production*, vol. 103, No. 1 (January, 1991), pp. 60-63.

<sup>95</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 8.

<sup>96</sup> Steven Prokesch, “Edges fray on Volvo’s Brave New Humanistic World,” *The New York Times*, (7 July 1991).

satisfaction and decrease alienation and its effects, Volvo utilized knowledge of job enrichment and human nature to develop the strategy.<sup>97</sup> Knowing that all humans have a desire to belong to a group and to feel appreciated for accomplishments helped shape their vision of work teams.

Teams composed of eight to ten people would have the responsibility of manufacturing cars from beginning to end, like true craftsmen.<sup>98</sup> This was a big change from the traditional assembly line; thereby, increasing job rotation, autonomy and significance. As a result of each team member being trained for all assembly duties, nearly three hours would pass before there was a repetition of a particular job, minimizing boredom and poor quality.<sup>99</sup> In fact, the teams handled their own schedules, quality inspections and hiring which are normally management functions. Also, all middle management and foremen jobs were eliminated and replaced with management-employee councils and employee-oriented facilities.<sup>100</sup> There were only two tiers of management in this plant which was quite unlike most other automobile manufacturing sites. Teams were able to voice concern to one of the six plant managers through the ombudsman who, in turn, related concerns to the president.<sup>101</sup> The ombudsman role was rotated between team members and the person to hold this position was decided by the people in the group. In addition to being the liaison between blue and white-collar workers, this person also

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<sup>97</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*, (28 August 1989).

<sup>98</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>99</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*, (28 August 1989).

<sup>100</sup> Pehr Gyllenhammar, "Volvo's Solution to the Blue Collar Blues," *Business and Society Review*, vol. 7 (Fall, 1973).

<sup>101</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*,

resolved group conflicts, assigned work, and gave reports to management.<sup>102</sup>

There were seven main tasks to accomplish on each vehicle and it took almost a year and a half to learn two or three of the tasks.<sup>103</sup> There was at least one specialist of each task in every group and as a member increased their skills in additional responsibilities, they received a promotion or a pay raise. Efforts were made to not distinguish differing levels of skill within a group, as it was not a competition but a team effort. By 1991, only five or six employees were specialized in all seven areas.<sup>104</sup>

The layout of the Uddevalla plant was in an "L" shape with work teams located in two complexes at far ends of the L-shaped building. Each complex had three separate ergonomically designed cells for assembly and a common lot was shared to test cars.<sup>105</sup> Within the building, large vehicle components, such as axels, were assembled while machines sort small parts into bags. Electronic carriers took these parts to each assembly team which was collectively working on three different cars at once, with not more than three workers on one car concurrently.<sup>106</sup> The automated carriers routed to the cells were programmed to arrive at set intervals during the job cycle.<sup>107</sup> The auto bodies moved around on magnetic tracks that were connected to machines designed for ergonomics;

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(28 August 1989).

<sup>102</sup> "Steering the Middle Road to Car Production," *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

<sup>103</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>104</sup> Robert F. Huber, "Sweden: The Good Life, With Challenges," *Production*, vol. 103, No. 1 (January, 1991), pp. 60-63.

<sup>105</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>106</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>107</sup> "Steering the Middle Road to Car Production," *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

employees are able to work comfortably around the product.<sup>108</sup>

Typically, a work team would spend two to three hours on one automobile; however, it took nearly fifty hours total production time per car when the handling of materials and quality inspections are included.<sup>109</sup> The factory had a production capacity of 40,000 cars a year but only 16,100 were produced in 1990. This trend remained until the plant's closure. Additionally, the plant had room for forty-eight different work teams but, at the plant's peak, only thirty-five teams were employed.<sup>110</sup> In 1993, the plant closed due to lack of consumer demand and wasted capacity. However, during Uddevalla's time, absenteeism decreased from about 20% to 8%.<sup>111</sup> Additionally, the turnover rate plunged from nearly 30% to only 5% in 1991.<sup>112</sup>

#### **Saab-GM: MALMO**

Saab Automobile A.B., an experimental plant in Malmo, Sweden, was only open from 1989 until 1991. Saab-Scania A.B. and General Motors Corporation jointly owned the Malmo site. Ironically, before it closed, industry reviews claimed it was "the auto factory of the future" and "one of the most worker-friendly" plants in the industry.<sup>113</sup> This reputation was a result of management's practices that improved the quality of working life for its employees. It entailed encouraging employee involvement, direct

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<sup>108</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*, (28 August 1989).

<sup>109</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>110</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>111</sup> Jonathan Kapstein, "Volvo's Radical New Plant: 'The Death of the Assembly Line'?" *Business Week*, (28 August 1989).

<sup>112</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>113</sup> "Steering the Middle Road to Car Production," *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

communication between hierarchical work levels, cooperation between management and union, increased efficiency, and improved sociotechnological integration.<sup>114</sup> Lessons were taken from the Trollhattan experiment, such as the success of the QLE/H system and ergonomics.<sup>115</sup>

This plant had work teams of six to ten people who would spend approximately twenty to thirty minutes on each vehicle within different “workshops” for various tasks. The motorcar then moved to the next area, of eight total, in a “straight-line assembly approach.”<sup>116</sup> One goal of the experiment was to adapt the assembly line in favor of ergonomics which was manifested through air suspension of the automobile while mechanically tilting it to desired directions. With this in mind, it was hoped that boredom and fatigue would be minimized while injuries resulting from work would be prevented, such as muscular and skeletal injuries.<sup>117</sup>

Executives claimed that the plant was closed due to a lack of demand in the market which could be satisfied by their main plant in Trollhattan, Sweden.<sup>118</sup> Plant closure resulted in laying off approximately 1,000 workers.<sup>119</sup> Unfortunately, as a result of only operating for two years, empirical evidence is not available concerning rates of absenteeism and turnover relative to job enrichment factors. The Malmo plant is

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<sup>114</sup> S.H. Fuller, & Berth Jonsson, “Corporate Approaches to the Quality of Work Life,” *Personnel Journal*, vol. 59, No. 8 (August, 1980), p. 632.

<sup>115</sup> Sorge, Marjorie, “Saab Quiets the Storm,” *Automotive Industries*, vol. 176, No. 2 (February, 1996), pp. 360.

<sup>116</sup> David Bennett & Ulf Karlsson. *Journal of Management*. (New York: M.E. Sharpe Inc., 1993).

<sup>117</sup> Robert F. Huber, “Sweden: The Good Life, With Challenges,” *Production*, vol. 103, No. 1 (January, 1991), pp. 60-63.

<sup>118</sup> Steven Prokesch, “Edges fray on Volvo’s Brave New Humanistic World,” *The New York Times*, (7 July 1991).

<sup>119</sup> Marjorie Sorge, “Saab Quiets the Storm,” *Automotive Industries*, vol. 176, No. 2 (February, 1996), pp. 127- 129.

significant because it demonstrates the desire of Saab-GM to continue experimenting in methods of job enrichment to discern effective and ineffective methods to minimize alienation within the automobile industry.

### **Toyota-GM: New United Motor Manufacturing, Inc.**

In 1984, a joint venture took place between Toyota Motor Corporation and General Motors Corporation, the New United Motor Manufacturing, Inc. (NUMMI) located in Fremont, California.<sup>120</sup> It was an experiment for both car companies and it was the first American experiment with the “Toyota way” of automobile manufacturing and management practices.<sup>121</sup> Toyota wanted to see if its Japanese lean production and management techniques would be accepted in the United States and GM desired to learn the secrets of Toyota’s success.<sup>122</sup> Fifteen years after opening, about a dozen GM department heads visit NUMMI daily to learn more about this unparalleled system of production.<sup>123</sup>

The site for NUMMI was built in 1962 as a “state-of-the-art” production facility for GM.<sup>124</sup> It closed in 1982 after wildcat strikes and “intense labor-management confrontations.”<sup>125</sup> The plant reported more than 20% absenteeism and “often shifts couldn’t start on time because not enough people had shown up for work.”<sup>126</sup> And, it

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<sup>120</sup> “NUMMI Gets New Labor Deal,” *Ward’s Auto World*, (September, 2001), p. 14.

<sup>121</sup> Lorna Fernandes, “New Boss’ Role at NUMMI is Trip Down Memory Land,” *San Francisco Business Times*, vol. 13, No. 52 (July, 1999), p. 7.

<sup>122</sup> James B. Treece, “Akio Toyoda Makes Name for Himself,” *Automotive News*, vol. 75, No. 5895 (September, 2000), p. 3.

<sup>123</sup> Lindsay Chappell, “GM Missed Early Lessons of NUMMI,” *Automotive News*, (June, 1999), p. 26.

<sup>124</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>125</sup> Gary S. Vasilash & Robin Yale Bergstrom, “NUMMI: Focusing On the Individual,” *Production*, vol. 107, No. 5 (May, 1995), p. 64 – 66.

<sup>126</sup> Gary S. Vasilash & Robin Yale Bergstrom, “NUMMI: Focusing On the Individual,” *Production*, vol.

developed a reputation for having “alcohol and drugs freely available on the premises.”<sup>127</sup>

At its time of closure, more than 60 firing disputes and over 1,000 grievances had not yet been handled.<sup>128</sup> In fact, some reports state “more than 6,000 grievances remained backlogged in the system.”<sup>129</sup>

GM relations with the UAW were clouded with intense confrontations and mistrust prior to the opening of NUMMI. However, executives understood the need to have union support in this joint venture to ensure success. Labor and management committed to a new relationship and composed an agreement letter stating, “Both parties are undertaking this proposed relationship with the full intention of fostering an innovative labor relations structure, minimizing the traditional adversarial roles, and emphasizing mutual trust and good faith.”<sup>130</sup>

This indicated a new tone for labor-management relations, which has been strengthened since 1984. Interestingly, 85% of the GM plant’s workforce was rehired for NUMMI as well as the old bargaining committee.<sup>131</sup> In 2001, a new labor deal was negotiated between the UAW and management representatives of NUMMI. The four-year contract includes increases in the cost of living allowance, lump sum payments,

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107, No. 5 (May, 1995), p. 64 – 66.

<sup>127</sup>Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>128</sup>Gary S. Vasilash & Robin Yale Bergstrom, “NUMMI: Focusing On the Individual,” *Production*, vol. 107, No. 5 (May, 1995), p. 64 – 66.

<sup>129</sup>Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>130</sup>Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>131</sup>Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

annual wages, and pension plan contributions for workers.<sup>132</sup> The original contract also included a Japanese element of job security, a “no-layoff policy” unless the “long-term viability of the company is threatened.”<sup>133</sup> This policy was considered the most important aspect of employment by 80% of workers at NUMMI and it “fostered the workers’ belief that they are valued as assets rather than as costs to be trimmed during downturns.”<sup>134</sup> Additionally, a union team was formed with the authority to improve ergonomics and to create a company fund for child-care assistance and tuition opportunities for workers and offspring.<sup>135</sup>

Since 1984, the turnover rate at this manufacturing site is something to boast about. In a decade, only four managers have left for other employment and in 1996, the entire plant overall reported a turnover rate of only 6% and absenteeism is down to around 2%.<sup>136</sup> Additionally, J.D. Power Associates consistently places the NUMMI plant near the top of the list for product quality.<sup>137</sup> In 1994, J.D. Power Associates also awarded the “Silver Quality Award” for the Geo Prizm produced at NUMMI.<sup>138</sup> In that same year, NUMMI was also named the “second-best plant in North America.”<sup>139</sup>

When NUMMI first opened its doors, Japanese Toyota veterans composed the

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<sup>132</sup> “NUMMI Gets New Labor Deal,” *Ward’s Auto World*, (September, 2001), p. 14.

<sup>133</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>134</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>135</sup> Matt Nauman, “Auto Workers in Fremont, California Approve Contract,” *Knight-Ridder/Tribune Business News*, (August, 2001), p. ITEM01220131.

<sup>136</sup> Gary S. Vasilash & Robin Yale Bergstrom, “NUMMI: Focusing On the Individual,” *Production*, vol. 107, No. 5 (May, 1995), p. 64 – 66.

<sup>137</sup> Gary S. Vasilash & Robin Yale Bergstrom, “NUMMI: Focusing On the Individual,” *Production*, vol. 107, No. 5 (May, 1995), p. 64 – 66.

<sup>138</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>139</sup> Matt Nauman, “How NUMMI Workers Did It: Secrets of the Auto Plant’s Success,” *Knight*

majority of the executives and managers. By 1997 only a quarter of the senior managers were Japanese. Gary Convis, NUMMI's Vice-President, said, "It's a reflection of the American side more deeply understanding the Japanese method."<sup>140</sup> A new culture has been established that is a combination of the Japanese and American cultures. The workforce is composed of more than "50% minorities" which has promoted a tolerant atmosphere for diversity which openly acknowledges differences.<sup>141</sup> NUMMI's corporate culture employs the philosophies of *kaizen*, *muda*, and *andon* in the day-to-day work life. *Kaizen* refers to the continuous improvement of the process, mainly the elimination of waste. *Muda* is the unnecessary remnants of production inhibiting complete efficiency. *Andon* is the constant communication vital to cooperation and proficient production.<sup>142</sup> In fact, in 1999 employees made nearly 27,000 suggestions for operation improvements and approximately 90% were utilized. Such community involvement and teamwork are key components to the company's success.<sup>143</sup>

Another facet of this philosophy is the methodology used in decision making. To foster interdependence, all decisions are reached through a period of collective information sharing. For instance, when an issue is under review, all persons affected will view a document with all relevant data. Each person is encouraged to make suggestions or changes until complete agreement is reached at which time all members sign off. The document then goes to the executive board that completes the same process. Therefore,

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*Ridder/Tribune News Services*, (June, 1994), p. 0624K6912.

<sup>140</sup> Douglas Robson, "Made in America: NUMMI Taps US Exec for No. 2 Spot," *San Francisco Business Times*, vol. 12, No. 9 (October, 1997), p. 3 - 5.

<sup>141</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, "Cultural Transformation at NUMMI," *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 - 114.

<sup>142</sup> Jack Doo, "Auto Interior Plant Receives Top Award," *The Modesto Bee*, (April, 2001), p.

many workers are allowed to contribute input before an overall consensus is reached.<sup>144</sup> This technique is also implemented in problem-solving circles.<sup>145</sup> Interdependence is encouraged through corporate-wide postings of performance data. Attendance boards, defect reports, quality reviews, and improvement records are available for all workers viewing. In this way, employees are held accountable for their expected contributions to the plant because each individual aids in the company's success.<sup>146</sup>

The NUMMI atmosphere not only encouraged a "blurring of lines between Japanese and Americans" but also between management and labor.<sup>147</sup> This was accomplished through eliminating executive benefits (such as reserved parking and an exclusive cafeteria), open office spaces, and fewer levels of management with streamlined job classifications.<sup>148</sup> In fact, Production Workers and General Maintenance are the only job classifications at NUMMI which "allows frequent job rotation, eliminating mind-dulling repetition and requiring large doses of training and cross-training."<sup>149</sup> Even within teams, the members and the leaders work for each other.<sup>150</sup>

The extensive education that employees must undergo equips them with the

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<sup>143</sup> Lindsay Chappell, "GM Missed Early Lessons of NUMMI," *Automotive News*, (June, 1999), p. 26.

<sup>144</sup> Gary S. Vasilash & Robin Yale Bergstrom, "NUMMI: Focusing On the Individual," *Production*, vol. 107, No. 5 (May, 1995), p. 64 – 66.

<sup>145</sup> Matt Nauman, "How NUMMI Workers Did It: Secrets of the Auto Plant's Success," *Knight Ridder/Tribune News Services*, (June, 1994), p. 0624K6912.

<sup>146</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, "Cultural Transformation at NUMMI," *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>147</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, "Cultural Transformation at NUMMI," *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>148</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, "Cultural Transformation at NUMMI," *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>149</sup> Robin Yale Bergstrom, "NUMMI: Engineering the Process," *Production*, vol. 105, No. 6 (June, 1993), p. 58.

<sup>150</sup> Matt Nauman, "How NUMMI Workers Did It: Secrets of the Auto Plant's Success," *Knight Ridder/Tribune News Services*, (June, 1994), p. 0624K6912.

proper resources to help identify defects and make informed decisions.<sup>151</sup> In fact, Toyota headquarters in Japan sent over more than 400 trainers to teach American counterparts the management and production system and nearly 600 employees were sent to Japan for instruction.<sup>152</sup> And, “100% of the workforce at NUMMI receives training, another rarity in the auto industry.”<sup>153</sup> Having such a knowledgeable workforce allows NUMMI to depart from the traditional assembly lines where operations run continuously. At NUMMI employees are encouraged to completely halt production to fix defects because they are trained to spot them. Ultimately, this results in higher quality and in an average day the line is stationary less than 5% of the time.<sup>154</sup> The entire plant’s assembly system actually runs on a conveyor belt which allows workers sixty seconds to accomplish set tasks before it moves on.<sup>155</sup> Depending upon the model, there are between 200 and 250 workstations per vehicle.<sup>156</sup> This philosophy of “true participative management (everyone is a team member) and a preoccupation with treating people with dignity, decency, and respect” has led to the success of the company and to the satisfaction of the workforce.<sup>157</sup>

Although, there were many workers still conditioned to the traditional methods of GM. These workers were reluctant to take advantage of employee empowerment options

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<sup>151</sup> Gary S. Vasilash & Robin Yale Bergstrom, “NUMMI: Focusing On the Individual,” *Production*, vol. 107, No. 5 (May, 1995), p. 64 – 66.

<sup>152</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>153</sup> Robin Yale Bergstrom, “NUMMI: Engineering the Process,” *Production*, vol. 105, No. 6 (June, 1993), p. 59.

<sup>154</sup> Lorna Fernandes, “New Boss’ Role at NUMMI is Trip Down Memory Land,” *San Francisco Business Times*, vol. 13, No. 52 (July, 1999), p. 7.

<sup>155</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>156</sup> Matt Nauman, “GM-Toyota Plant Gets Makeover to Produce Joint-Venture Car,” *Knight-Ridder/Tribune Business News*, (January, 2002), p. ITEM02018015.

<sup>157</sup> Gary S. Vasilash & Robin Yale Bergstrom, “NUMMI: Focusing On the Individual,” *Production*, vol. 107, No. 5 (May, 1995), p. 64 – 66.

and opportunities to offer input. For example, workers are empowered to stop the assembly line for defects but some employees are “worr[ie]d that they might be punished or that their supervisors will be disciplined” and often, they do not completely stop the procession but just gain their superior’s attention.<sup>158</sup> Mike Torres, a NUMMI employee of 13 years claims that his job is both exciting and stressful; “It’s a lot of strain, but you know what? I think in the long run it’s going to be worth it. When we see these cars getting out of here, it puts a smile on your face.”<sup>159</sup>

In 1998, NUMMI earned approximately \$4.5 billion in revenue.<sup>160</sup> Today, after doubling the plant’s size, the NUMMI plant has 4.5 million square feet of manufacturing space with 2,000 feet of power-and-free conveyor belts running through the entire assembly line. This plant manufactures about 1,500 automobiles daily and is running at full capacity.<sup>161</sup> In 1999, output was at 360,000 units per year.<sup>162</sup> NUMMI employs a new type of technology for increased efficiency and decreased plant traffic, Automatic Guided Vehicles (AGV). These are “wire-guided vehicles that will automatically deliver parts to workers and remove the empty dollies that had held those parts” and in 2002 NUMMI operated nine AGVs.<sup>163</sup> NUMMI operates on a just-in-time system for delivery of components. One of NUMMI’s 260 suppliers, Amtex boasts, “We ship to NUMMI

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<sup>158</sup> Wellford W. Wilms, Alan J. Hardcastle & Deone M. Zell, “Cultural Transformation at NUMMI,” *Sloan Management Review*, vol. 36, No. 1 (Fall, 1994), p. 99 – 114.

<sup>159</sup> Matt Nauman, “GM-Toyota Plant Gets Makeover to Produce Joint-Venture Car,” *Knight-Ridder/Tribune Business News*, (January, 2002), p. ITEM02018015.

<sup>160</sup> Lorna Fernandes, “New Boss’ Role at NUMMI is Trip Down Memory Land,” *San Francisco Business Times*, vol. 13, No. 52 (July, 1999), p. 7.

<sup>161</sup> Lorna Fernandes, “New Boss’ Role at NUMMI is Trip Down Memory Land,” *San Francisco Business Times*, vol. 13, No. 52 (July, 1999), p. 7.

<sup>162</sup> David Maloney, “Conveyor Saves NUMMI \$1.5 Million,” *Modern Materials Handling*, vol. 54, No. 10 (September, 1999), p. 36-39.

<sup>163</sup> Matt Nauman, “GM-Toyota Plant Gets Makeover to Produce Joint-Venture Car,” *Knight-Ridder/Tribune*

every two hours, twelve times a day . . . by the time the parts leave here, they're installed in cars within four hours."<sup>164</sup> This system helps limit unnecessary expenditures for overhead and storage as well as maintaining efficiency on the assembly line.<sup>165</sup>

Not only does NUMMI incorporate continuous training, feedback, and job rotation into its operations, but it goes one step further than other automobile manufacturing plants with its active policy of employee empowerment and collective decision making. Both of these factors contribute to a sense of significance in task and position for employees at the New United Motor Manufacturing, Inc.

### **GM: The Saturn Project**

During the same period that General Motors was experimenting with job enrichment in its Swedish Trollhattan and Malmo automobile manufacturing sites, it was also considering new ideas for American production. The birth of Saturn Corporation, the first nameplate added to GM's line since 1918, came in January of 1985 and materialized in 1990.<sup>166</sup> At the time, GM executives stated, "We believe Saturn is the key to GM's long-term competitiveness, survival, and success."<sup>167</sup> Located in Spring Hill, Tennessee, Saturn utilized its corporate culture and management philosophies to increase the enrichment of each position for all employees, which entailed a different plan of operation compared to the Swedish case studies previously discussed. Spurred by increased competition by Japan's lean production methods, as well as a recession in the

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*Business News*, (January, 2002), p. ITEM02018015.

<sup>164</sup> Jack Doo, "Auto Interior Plant Receives Top Award," *The Modest Bee*, (April, 2001), p. ITEM01095057.

Jack Doo, "Auto Interior Plant Receives Top Award," *The Modest Bee*, (April, 2001), p. ITEM01095057.

<sup>166</sup> Gary S. Vailash, "Nearing Saturn," *Production*, vol. 101, No. 6, (June, 1989). pp. 42-44.

United States, GM realized it needed a highly competitive product with world-class methods of production.<sup>168</sup> This wholly owned subsidiary was to be a revolution among car manufacturers for both internal structure and processes. Starting at ground zero, Saturn Corp. aspired to become a manufacturer unlike its parent company that was well known for its large bureaucracies.<sup>169</sup> In fact, GM was infamous for using “management prerogatives” and “well-defined, mindless job classifications” which Saturn rejected with its own philosophy of “every worker is a manager.”<sup>170</sup>

The Saturn project began with extensive research conducted jointly by the “group of 99” composed of GM and the United Auto Workers (UAW). The “group of 99” sought to find elements common among the most successful companies in the world. The following concepts became evident:

1. Quality was a top priority to maintain customer satisfaction.
2. Everyone in the company has ownership and is responsible for successes and failures.
3. Equality is practiced, not just preached.
4. People are the company’s most important assets.
5. Union and management are partners, sharing the responsibility of the success or failure of the enterprise.<sup>171</sup>

These became the goals of Saturn that were to separate the company as unique among others and would become the foundation for creating enriching positions for employees. Therefore, a joint union-management agreement for operation was developed which extended throughout the entire corporation creating an industrial democracy based

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<sup>167</sup> Alex Taylor III, “Back to the Future at Saturn,” *Fortune*, vol. 118, No. 3, (August, 1988), pp. 63-67.

<sup>168</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

<sup>169</sup> Maryann Keller, “Can Saturn Deliver?” *Automotive Industries*, vol. 168, No. 6, (June, 1988), pp. 17.

<sup>170</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

upon “consensus-based organization.”<sup>172</sup> In fact, for every manager at the plant, there is a UAW counterpart who participates fully in the decisions faced at Saturn.<sup>173</sup>

The management-union relationship at Saturn is unique in comparison to traditional automobile manufacturers. Before the plant opened, they jointly developed an unprecedented labor contract that included a provision for lifetime employment for four-fifths of the workers, save economic emergencies. Also, whereas normal contracts expire, this was deemed a “living” document” which could be opened and discussed at any time.

The contract also stated that the union would be an equal partner to the management team, not to say that the picture has always been without conflict. They do disagree but “it’s not adversarial. It’s more advocacy in terms of finding a better solution or better options” for the best interests of the entire organization.<sup>174</sup>

GM-Saab in Trollhattan and Malmo, Sweden both employed the team structure and close ties with unions to help improve employee satisfaction. These successful strategies were transferred to the Saturn Project; however, the corporate culture and management philosophies made this company unique. First and foremost, Saturn made it well known that it was a company goal to tap into the skills and creative potential of every worker for the benefit of everyone, not just the company. It is evident in philosophy and practice at Saturn that each member of the staff was equal in their stake in the company; a partnership between all people in all positions. In Spring Hill, visitors

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<sup>171</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

<sup>172</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

<sup>173</sup> Beverly Geber, “Saturn’s Grand Experiment,” *Training*, vol. 29, No. 6 (June, 1992), p.29.

<sup>174</sup> Beverly Geber, “Saturn’s Grand Experiment,” *Training*, vol. 29, No. 6 (June, 1992), pp. 27 – 36.

will not see separated cubicles, segregated dining areas, or reserved parking but casual attire and a welcoming, comfortable atmosphere will be evident. This was also enforced through the obliteration of "superficial barriers that denote rank" from the office of the CEO to the production areas.<sup>175</sup>

Additionally, to encourage hard work and a sense of ownership in the corporation, compensation and benefits are directly linked to job performance.<sup>176</sup> Saturn's management team jointly agreed with the UAW to implement a unique system for rewarding high performances with increased pay. This system puts 20% of employees' pay at risk if set goals are not achieved; however, met goals result in greater return for each worker.<sup>177</sup> The excess of 100% base pay will be determined in relation to company profitability.<sup>178</sup> In fact, in 1997, this system really paid off as 7,300 Saturn employees each received approximately \$10,000 in addition to base wages because goals were met.<sup>179</sup> The goal of this system is to promote hard work, continuous improvement, and a sense of ownership in the company's success (or failure).<sup>180</sup>

All employees received extensive training over the responsibilities of various jobs for this integrated corporate system.<sup>181</sup> It is a continuous training method to keep workers constantly informed of changing technology which is essential for these teams who are empowered to strive for their own methods of self-improvement. "Its comprehensive

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<sup>175</sup> Maryann Keller, "Can Saturn Deliver?" *Automotive Industries*, vol. 168, No. 6, (June, 1988), pp. 17.

<sup>176</sup> Gary S. Vailash, "Nearing Saturn," *Production*, vol. 101, No. 6, (June, 1989), pp. 42-44.

<sup>177</sup> Robert R. Rehder, "Is Saturn Competitive?" *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

<sup>178</sup> Alex Taylor III, "Back to the Future at Saturn," *Fortune*, vol. 118, No. 3, (August, 1988), pp. 63-67.

<sup>179</sup> "Saturn Struggles with GM's Global Strategy," *Ward's Auto World*, vol. 33, No. 9, (September, 1997), pp. 26.

<sup>180</sup> Robert R. Rehder, "Is Saturn Competitive?" *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

education and training center programs” have been dubbed Saturn U. where an average worker will learn production information, as well as “such topics as team and consensus building, leadership, problem identification and solving, and total quality management.”<sup>182</sup> In fact, each employee has an Individual Training Plan (ITP) that is a schedule of courses to be taken, including general requirement and specialized courses. For example, production workers might take a general class on the Saturn Mission but also a specialized class over hazardous materials.<sup>183</sup> Such extensive training at Saturn U. and on-the-job was believed to be part of the solution to the challenge of global competition.

The competitive vision for the Saturn Company was optimistic in the goal for it “to be an economical Japanese car-buster that would be turned out with unprecedented manufacturing technology.”<sup>184</sup> This aim to produce vehicles more efficiently and effectively than Japan’s unparalleled lean production manufacturing plants would make Saturn globally competitive in price and quality. Therefore, knowledge was compiled from the leading technological automobile manufacturers around the world, including Volvo’s Kalmar and Uddevalla systems of operation. From these Swedish plants, Saturn decided to also pursue sociotechnological systems design to “ensure a balanced development of its people and technology as an essential part” of the entire corporation.<sup>185</sup> With the use of STSDs, complete integration of the information system of

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<sup>181</sup> Gary S. Vailash, “Nearing Saturn,” *Production*, vol. 101, No. 6, (June, 1989). pp. 42-44.

<sup>182</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

<sup>183</sup> Beverly Geber, “Saturn’s Grand Experiment,” *Training*, vol. 29, No. 6 (June, 1992), p. 35.

<sup>184</sup> Gary S. Vailash, “Nearing Saturn,” *Production*, vol. 101, No. 6, (June, 1989). pp. 42-44.

<sup>185</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp.

the entire Saturn Corporation has been achieved. This information system makes feedback readily available to all functional departments, such as “human resources, finance materials management, manufacturing, product engineering, corporate communications, sales and service, and marketing.”<sup>186</sup>

However, even before the manufacturing site was built, GM dreamers realized that the corporate goal of maximizing employee satisfaction and minimizing alienation could be achieved but to be successful in operations, the company must also be globally competitive.<sup>187</sup> Although, the desired level of production was never achieved, Saturn did utilize traditional and modern innovative methods of production. For instance, robots were used for such jobs as welding and painting.<sup>188</sup> With the objective of increasing production speed while improving quality, Saturn used teams, called “work units,” to simultaneously develop manufacturing and engineering practices to improve problem areas quickly.<sup>189</sup>

Work units were comprised of representatives from different areas of production, such as “manufacturing, product engineering and finance” or “powertrain, body and chassis,” as well as two co-advisors from management and from UAW.<sup>190</sup> These teams conducted their own “time analysis, statistical quality measures, and constant improvement,” which was not controlled by management.<sup>191</sup> Team leaders, called work-

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<sup>186</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

<sup>187</sup> Maryann Keller, “Can Saturn Deliver?” *Automotive Industries*, vol. 168, No. 6, (June, 1988), pp. 17.

<sup>188</sup> Gary S. Vailash, “Nearing Saturn,” *Production*, vol. 101, No. 6, (June, 1989). pp. 42-44.

<sup>189</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

<sup>190</sup> Gary S. Vailash, “Nearing Saturn,” *Production*, vol. 101, No. 6, (June, 1989). pp. 42-44.

<sup>191</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp.

team counselors, were delegated the responsibility of hiring eight to fifteen of their own team members. Within the group, all decisions are made by consensus but this philosophy is governed by the provision that members must have a 70% "comfort level" with the decision or an alternative route must be offered.<sup>192</sup> Additionally, work units were empowered to handle intergroup disputes, rotate duties (including leadership roles), and make operational choices, as well as other important tasks essential to efficient operation.<sup>193</sup> Even more impressively, teams keep track of the amount of waste they use and must make forecasts for the amount of capital necessary for the next year.<sup>194</sup>

The Saturn facility is a mile-long operations site that is subdivided into three separate functional manufacturing areas - powertrain, body systems, and vehicle systems -- all of which are dependent upon a just-in-time arrival system for parts with a one-day supply in inventory.<sup>195</sup> These three areas move the automobile from its initial lost-foam castings to the final assembly through a skillet system method. In this process, teams move with the product on an ergonomic platform of the conveyor belt until the task is finished which averages to seven minutes each cycle. In comparison, Uddevalla cycles generally took three hours while the Japanese lean production system averaged one minute per cycle.<sup>196</sup> The overall manufacturing process involves a statistical process control (SPC) for monitoring purposes; however, workers maintain autonomy, as it is the

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<sup>192</sup> Beverly Geber, "Saturn's Grand Experiment," *Training*, vol. 29, No. 6 (June, 1992), p. 33.

<sup>193</sup> Robert R. Rehder, "Is Saturn Competitive?" *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

<sup>194</sup> Beverly Geber, "Saturn's Grand Experiment," *Training*, vol. 29, No. 6 (June, 1992), pp. 27 - 36.

<sup>195</sup> Alex Taylor III, "Back to the Future at Saturn," *Fortune*, vol. 118, No. 3, (August, 1988), pp. 63-67.

<sup>196</sup> Robert R. Rehder, "Is Saturn Competitive?" *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

responsibility of each to react to the statistical process results.<sup>197</sup>

Assessments of job enriching elements at Saturn reveal that autonomous work teams are able to rotate a variety of tasks which must be completed every seven minutes. A joint management-union team offers feedback, opportunities for continuous training, and a sense of ownership in the company.

Unfortunately, the Saturn project is not entirely a pretty picture. As an automotive manufacturing company, it deals with the normal grievances for noise, stress, long hours and repetitive work. Additionally, although this corporate structure is uniquely made of a joint management-union board, this also results in increased tension as Saturn managers typically receive higher pay than their UAW counterparts even when responsibilities are equally shared. Criticisms have been voiced by workers who question the selection process for union officials when their interests have not become truly represented.<sup>198</sup>

Also, from the get go the Saturn Corporation desired an enriching environment for workers, as well as an internationally competitive manufacturing facility. In 2000, executives admitted that “getting established in Japan’s automotive market has proven to be even more challenging than anticipated.”<sup>199</sup> As Saturn remains largely unprofitable, with 11% decrease in sales in 1998 which was becoming a consistent trend, GM has been pushing for its “globalization and standardization” of Saturn processes.<sup>200</sup> GM planned to open bidding to outside sources for parts normally manufactured in Saturn which could lead to lay-offs. Saturn workers reacted with a “landslide vote, authoriz[ing] their leaders

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<sup>197</sup> Gary S. Vailash, “Nearing Saturn,” *Production*, vol. 101, No. 6, (June, 1989), pp. 42-44.

<sup>198</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp. 7-16.

<sup>199</sup> “Getting Established in Japan’s Automotive Market,” *Japan-U.S. Business Report*, (April, 2000), p. 42.

to call a strike over General Motors plan.”<sup>201</sup> In retrospect, many GM and Saturn executives can see the folly of designing Saturn for in-house production of so many parts which was a lesson that other manufacturers could learn vicariously.<sup>202</sup>

Slowly, Saturn watches its autonomy and unique culture being assimilated into GM’s standardized methods.<sup>203</sup> Currently, Saturn still operates with a job enrichment structure; however, ultimately the level of Saturn’s efficiency in comparison to Japan’s lean production will determine if job enrichment programs will be foregone in favor of profitability.<sup>204</sup> Additionally, “at least in the eyes of local UAW officials, the venture’s model decision-making partnership between management and union has been overtaken by traditional GM decision making in Detroit.”<sup>205</sup> It appears that as the market is shrinking, so to is the commitment to worker participation in decisions and the union of labor and management.

### A Comprehensive Analysis

A comprehensive, general analysis of the above case studies revealed a common thread of job enrichment elements. Table A: Job Enrichment Methods of Automobile Manufacturing Plants is provided for comparison of the six preceding case studies and the various methods utilized to increase the quality of work life among employees (p. 60).

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<sup>200</sup> “Is This the End of Saturn?” *Ward’s Auto World*, (September, 1998).

<sup>201</sup> Lindsay Chappell, “Workers Worry Saturn Isn’t Special, After All,” *Automotive News*, vol. 72, No. 5777, (July, 1998), pp. 50.

<sup>202</sup> Lindsay Chappell, “Workers Worry Saturn Isn’t Special, After All,” *Automotive News*, vol. 72, No. 5777, (July, 1998), pp. 50.

<sup>203</sup> “Saturn Struggles with GM’s Global Strategy,” *Ward’s Auto World*, vol. 33, No. 9, (September, 1997), p. 26.

<sup>204</sup> “Is This the End of Saturn?” *Ward’s Auto World*, (September 1998).

<sup>205</sup> Chappell, Lindsay, “Workers Worry Saturn Isn’t Special, After All,” *Automotive News*, vol. 72, No.

They were innovative and invaluable efforts to achieve an atmosphere of greater satisfaction among workers, collaboration between management and labor, and efficient, flexible and competitive operations. The programs utilized task variety, autonomy, feedback, task significance, and job identity to increase the satisfaction of employees. Duties were diversified and autonomy was increased as workers were organized into work teams with the authority to rotate responsibilities and complete tasks as desired. Members had the autonomy to decide the manufacturing process and it was also their responsibility to remain on task in order to accomplish the desired output. No longer were employees required to accomplish one specific job continuously but were able to become competent in several different areas through an ongoing training process. Group members were given feedback from superiors, as well as peers. Additional feedback was available from company ratios for defects per lot of automobiles produced, rates of actual output versus capacity of output, and industry averages for unit completion time. Workers were able to gain task significance and job identity, as they were able to view the final product and know their contributions to its success.

A careful analysis of the results correlating to these job enrichment work elements revealed that, in general, higher productivity than projected was achieved, production time decreased, and quality increased. However, some margins of change were very slim. Overall, the sites reported increased worker satisfaction which was demonstrated through decreased absenteeism and turnover rates.

Saturn and NUMMI are the only sites currently operating at full capacity and

Trollhattan is the only Swedish plant of the four case studies that is still operating today. Clearly, there are lessons to be learned from these experiments concerning effective and ineffective, as well as efficient and inefficient methods of employing sociotechnological systems designs. Although, complicating factors cannot be dismissed either, such as the fluctuating consumer demand for particular vehicles or the dynamics of the economy.

Overall, these case studies have demonstrated the need for change in the internal structure for operations within manufacturing plants and that positive consequences do result from job enrichment programs. It seems that the positive results achieved through the smaller scale and more economical enrichment programs implemented at Saturn and NUMMI could serve as motivators for utilizing the sociotechnological systems design approach throughout the industry. Therefore, one must wonder about the reasons these programs are not employed throughout the entire automobile manufacturing sector of the industry.

#### **Why have these job enrichment techniques not been adopted across the industry?**

In general, the three determining factors that keep job enrichment methods from being implemented across the industry include competition, capital, and cultural barriers. This section presents a generalized overview of the significance of these three areas, using examples from the six case studies discussed in this thesis for empirical support. Obviously, the real world is influenced by a greater complexity of interests than just those reasons discussed here; however, a study of all influencing factors would be too extensive for this thesis.

## Competition

The unfortunate fact is that these experimental sites (with the exception of NUMMI) were not competitive on a domestic level, let alone internationally. Lennart Ericsson, president of the union representing the Uddevalla employees, stated in 1991, "I am convinced that our way will be successful and competitive. Our next goal is to be better than Kalmar, and when we get to that goal, our goal will be to get to Ghent."<sup>206</sup> This statement was ironic because as previously demonstrated, Uddevalla was severely lagging behind Kalmar and the aspiration to be as efficient as Ghent was not up to the international competition par. Volvo's Ghent plant utilized a traditional assembly line and was far behind the production levels of Japanese lean manufacturers of that period.<sup>207</sup>

In fact, in comparison to Japanese lean production plants, the experimental sites' margin of disadvantage was indicative of the inequality in international production levels. The Massachusetts Institute of Technology conducted a study of the automobile industry and documented results in The Machine That Changed the World.<sup>208</sup> It was discovered that the Japanese style of lean production was much more efficient than the Swedish human oriented plants. Specifically, the "leading lean production plant it studied needed only 13.3 hours to weld, paint and assemble a car slightly smaller and less elaborate than the large luxury cars made at Uddevalla, which requires about 50 hours, excluding

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<sup>206</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>207</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>208</sup> J.P. Womack, D.T. Jones, & D. Roos, *The Machine that Changed the World*. (New York: HarperPerennial, 1990).

welding and painting.”<sup>209</sup> With these statistics, a company such as Toyota could complete 3.5 times more cars than the Uddevalla plant in the same amount of time. In the modern business environment, competition is international in scope and the less adept quickly fall behind.

Nor was Saturn up to the Japanese par set by lean production. Saturn generally operated three shifts with overlapping ten-hour days six days a week. Workers suffered from a highly stressful and repetitive environment and some operation goals were still not met. Capacity was at 300,000 units, which was just enough to break even while 400,000 to 500,000 cars were needed to reach the desired level of profits. This is not a globally competitive operation when it is struggling just to break even as the market is declining.<sup>210</sup>

### **Capital Expenditures and Losses**

It appears that even with the capital saved from reduced absenteeism and turnover rates were not enough to offset the costs of expenditures of a successful program. Start-up investments, opportunity costs, employee training, benefit packages, and post-construction building expenditures are costly. Start-up costs for sites include an entirely new plant or drastic reconstruction on existing sites because they use employee-oriented facilities. For example, the mile long North American Saturn plant required an initial \$5 billion investment which took about a decade to recoup.<sup>211</sup> It was originally estimated to

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<sup>209</sup> J.P. Womack, D.T. Jones, & D. Roos, *The Machine that Changed the World*. (New York: HarperPerennial, 1990).

<sup>210</sup> Rehder, Robert R., “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), p. 16.

<sup>211</sup> “Saturn Struggles with GM’s Global Strategy,” *Ward’s Auto World*, vol. 33, No. 9, (September, 1997), p. 27.

cost only \$3.5 billion.<sup>212</sup> Additionally, the plant in Uddevalla, Sweden cost nearly \$220 million to construct.<sup>213</sup>

Unfortunately, Volvo Uddevalla never reached full capacity. At its peak, only thirty-five of forty-eight possible teams were employed which means that the actual production levels were much lower than the original projections for output.<sup>214</sup> When capacity is not utilized, it creates wasted space and money. The opportunity cost equals all the cars that could have been produced with that capacity. Common disruptions in the production flow also cost the industry the advantage of greater output, as “the increasing number of model variants made material supply difficult, and failure to complete the tasks on time caused problems.”<sup>215</sup> In this case, the company lost potential profits as output was lower than capacity due to inefficiencies in the system.

Additionally, Malmo, Trollhattan, and Kalmar did not reach full capacity and even Saturn was much less productive than expected in its beginning years. In fact, it was less productive than similar capacity Japanese plants which caused a loss in market share and indicated Saturn was lagging behind in global competition. GM reported that in Saturn’s third year of operation, it still had about \$700 million in losses. Saturn did break even in later years but GM utilized “creative accounting” and placed some of Saturn’s expenditures on GM books.<sup>216</sup>

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<sup>212</sup> Beverly Geber, “Saturn’s Grand Experiment,” *Training*, vol. 29, No. 6 (June, 1992), p. 27.

<sup>213</sup> Jonathan Kapstein, “Volvo’s Radical New Plant: ‘The Death of the Assembly Line?’” *Business Week*, (28 August 1989).

<sup>214</sup> Steven Prokesch, “Edges fray on Volvo’s Brave New Humanistic World,” *The New York Times*, (7 July 1991).

<sup>215</sup> “Steering the Middle Road to Car Production,” *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

<sup>216</sup> Robert R. Rehder, “Is Saturn Competitive?” *Business Horizons*, vol. 37, No. 2, (March-April, 1994), pp.13.

An advantage of decreased turnover is that investments into additional training are viewed as more worthwhile because long-term employment is expected. However, “Volvo says a worker typically requires 16 months of training before he or she can do two or three of the seven groups of tasks needed to build a car.”<sup>217</sup> After 1.25 years and extensive training, workers are still unable to do even half of the tasks necessary to complete the job. At this rate, it would take nearly four years just to become well-rounded in competency and even with a minimized level of turnover and absenteeism, it is difficult to keep all employees on the same “stage of the learning curve” which may lead to frustration.<sup>218</sup> Extensive training was also required for the other job enrichment plants. As previously noted, NUMMI invested a substantial amount of capital in transportation costs alone for training purposes, hundreds of Americans visited Japan and vice versa. Additionally, when NUMMI first opened, nearly all executives were transplants from Toyota sites in Japan which put the burden of relocation costs on the corporation.<sup>219</sup> Saturn also provided relocation costs for the 6,885 employees “drawn from 136 GM locations in 34 states.”<sup>220</sup> About \$2,700 was allotted to relocated families to assist in this venture.<sup>221</sup>

The autonomy built into the Saab-GM and Volvo work-teams allowed the teams to design their own sequence to constructing the vehicle which was not always the best way. It appears that with the long-run trends, it was necessary to have control of the

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<sup>217</sup> Steven Prokesch, “Edges fray on Volvo’s Brave New Humanistic World,” *The New York Times*, (7 July 1991).

<sup>218</sup> “Steering the Middle Road to Car Production,” *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

<sup>219</sup> Douglas Robson, “Made in America: NUMMI Taps US Exec for No. 2 Spot,” *San Francisco Business Times*, vol. 12, No. 9 (October, 1997), p. 3 - 5.

<sup>220</sup> Beverly Geber, “Saturn’s Grand Experiment,” *Training*, vol. 29, No. 6 (June, 1992), pp. 28.

process to ensure high quality and to avoid having to rebuild.<sup>222</sup> Although a projected benefit of job enrichment was to increase the standard level of quality, the autonomy given to workers in the manufacturing process actually resulted in many “post-build rectification” needs, as the car was not built correctly the first time.<sup>223</sup> Therefore, to circumvent needless expenditures to correct manufacturing defects, it was necessary to direct the order of manufacturing tasks which was opposed to the objectives of job enrichment programs within the Swedish plants. This was not problematic at the Saturn or NUMMI plants due to the fact that the sequence of construction was not determined by the workers.

Finally, teams composed of management and labor jointly operated both NUMMI and Saturn. One result of this arrangement was that both companies formed labor contracts that included no layoff policies for workers unless an economic crisis that was devastating to the company happened. With a declining market, Saturn was forced to cut nearly 50,000 automobiles from annual production in order to cut production costs without laying off workers. This was a financial hardship for the company which could have been handled differently with normal contract provisions concerning layoffs.<sup>224</sup>

### **Cultural Barriers**

It may be that one reason job enrichment features are not transferred into plants across the industry was because of cultural barriers. Every country has different mores

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<sup>221</sup> Taylor III, Alex, “Back to the Future at Saturn,” *Fortune*, vol. 118, No. 3, (August, 1988), pp. 63-67.

<sup>222</sup> “Steering the Middle Road to Car Production,” *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

<sup>223</sup> “Steering the Middle Road to Car Production,” *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

<sup>224</sup> Chappell, Lindsay, “Workers Worry Saturn Isn’t Special, After All,” *Automotive News*, vol. 72, No. 5777, (July, 1998), p. 51.

intrinsic to their culture. For instance, high rates of absenteeism may be a reflection of the work force composition and worker values. Approximately 40% of the labor force in Sweden is composed of women who still accept the majority of domestic responsibilities and therefore, are more likely to stay home when the children are sick or to take care of other domestic responsibilities.<sup>225</sup> One complicating factor of the Swedish society became evident when studying Frederick Winslow Taylor's methodology for hiring employees. He hired only those who were mentally capable for the job at hand. This is relevant in considering the composition of the Swedish labor force. In general, the populace is too educated for mere specialization of one particular task. These highly educated workers easily become dissatisfied without challenges in the work place, leading to absenteeism and turnover. Other barriers that may hinder the movement of standardized programs into other countries includes language differences.

Another option to consider is that not all employees enjoy job enrichment. A worker from Uddevalla said, "it was sometimes experienced as stressful, and there was always some uncertainty as to exactly where the workers were in the work cycle at any particular moment and how much time remained for the allotted tasks."<sup>226</sup> It is also true that some people desire to have a job where the motions become so familiar that it is practically automatic and little thought is required. This is "the problem of workers who do not want or are not capable of being involved in decision making."<sup>227</sup>

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<sup>225</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>226</sup> "Steering the Middle Road to Car Production," *Personnel Management*, vol. 25, No. 6 (1993), p. 34.

<sup>227</sup> Susan Parks, "Improving Workplace Performance," *Monthly Labor Review*, vol. 118, No. 5 (May 1995),

## Conclusion

In conclusion, the efforts of Saab-GM, Volvo, Saturn, and NUMMI to decrease the negative effects of alienation within the workforce were worthwhile but costly experiments. Although promising results were achieved, such factors as capital expenditures, worldwide competition and cultural barriers do not promote the idea of projects similar to those at the Trollhattan, Malmo, Uddevalla, and Kalmar manufacturing sites. However, the results of decreased absenteeism and turnover coupled with greater employee contentment could serve as encouragement to auto manufacturers around the world to look at smaller scale and more economical enrichment programs, such as those implemented at Saturn and NUMMI.

One cannot help but wonder if a sufficient opportunity was given to achieve the competitive success that is necessary to be globally competitive. As previously stated, the program at the Personvagnar Uddevalla-verken AB manufacturing site required sixteen months to become trained in half of the necessary tasks.<sup>228</sup> Uddevalla was only open from 1986 until 1993 and statistics reveal that only about half a dozen employees were qualified in all seven areas at the time of the plant's closure.<sup>229</sup> It does not appear that adequate time was allowed to really enhance the skills of the workforce. As Womack, Jones, and Roos stated, perhaps Volvo Uddevalla went a little too far – at times, the experiment appeared to be a technological regression where employees became craftsmen who worked laboriously for hours when the same tasks could be accomplished at Japan's

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pp. 18 – 29.

<sup>228</sup> Steven Prokesch, "Edges fray on Volvo's Brave New Humanistic World," *The New York Times*, (7 July 1991).

<sup>229</sup> Robert F. Huber, "Sweden: The Good Life, With Challenges," *Production*, vol. 103, No. 1 (January,

Toyota in a third of the time.<sup>230</sup> Obviously, strategic decisions had to be made that were favorable to international competition.

During the 1970s there was a major swell of automobile manufacturers exporting, marketing and, sometimes, producing their cars in foreign markets. Therefore, competition was no longer solely domestic but international as well. In ensuing decades, many mergers and acquisitions took place, changing the composition of the automobile industry. With combined finances, knowledge, skills and other factors, these bigger companies had a wider grasp on the worldwide market share. With increasing competition and constantly changing technology, the pressure was mounting for individual firms to increase productivity while encouraging organizational flexibility. Some believe this flexibility will occur through a “utopian vision of industrial democracy” where every worker will be given the opportunity to contribute input for every corporate decision.<sup>231</sup> However, corporate democracy would be an extreme form of job enrichment while simply encouraging employee participation appears more likely for the future.

It seems to be a fine line on which the sociotechnological relationship is developed, especially since labor is often replaced with more efficient technology. Some analysts believe that the STSDs serve as “a means of reversing the alienating effects of technological innovation . . . aim[ed] to preserve the challenging, satisfying and socially

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1991), pp. 60-63.

J.P. Womack, D.T. Jones, & D. Roos, *The Machine that Changed the World*. (New York: HarperPerennial, 1990).

<sup>231</sup> Susan Parks, “Improving Workplace Performance,” *Monthly Labor Review*, vol. 118, No. 5 (May 1995), pp. 18 - 29.

rewarding aspects of work through the team concept, worker rotation ...”<sup>232</sup> Other experts argue that these programs fail to “enhance the nature of work in ultramodern facilities” which results in workers “feeling more like interchangeable parts than before.”<sup>233</sup> However, a synthesis between quality of work life and industrial efficiency cannot be ruled impossible even as the highly productive, less human-oriented Japanese methods of lean production are currently dominant.

Looking toward the future, it is important to recognize that many elements of job enrichment do not require extensive capital investments. The vital ingredients to success in this area are fairly evident. Provide the resources for employees to succeed whether it is training, tools or information – feedback is a necessity, as is the establishment of goals. Develop channels of communication that are readily available and encourage workers to make use of them. Publicly recognize successes as well as areas that need improvement, specifically stating methods to continue or achieve future success. Emphasis on long-term employment, internal promotion policies, and reward systems that are dependant upon achieving company goals can foster a feeling of community and encourage workers to feel individually valuable to the success of the whole. Advocates of job enrichment claim “At the end of every working day, people leave either more motivated to come back and do their jobs again tomorrow or less motivated as a result of what happens to them that day.”<sup>234</sup> Small, reasonable provisions make a huge difference in employee

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<sup>232</sup> Dale Feuer, “Quality of Work Life: A Cure for All Ills?” *Training: the Magazine of Human Resources Development*, vol. 26, No. 2 (February, 1989), p. 65.

<sup>233</sup> Dale Feuer, “Quality of Work Life: A Cure for All Ills?” *Training: the Magazine of Human Resources Development*, vol. 26, No. 2 (February, 1989), p. 66.

<sup>234</sup> Shari Caudron, “The Top 20 Ways to Motivate Employees,” *Industry Week*, vol. 244, No. 7 (April, 1995), p. 12 – 17.

satisfaction.

A complicating factor for the implementation of job enrichment programs may arise from the union sector. In general, autoworkers' unions are not opposed to sociotechnological systems design of job enrichment programs entering automobile manufacturing plants. This is true because the role of the union is to represent the workers' best interests and increased quality of work life is definitely a positive for workers in a traditionally specialized industry. However, problems arise in relation to the appropriate extent of employee involvement in organizational decisions because trade unions generally are the representative entity for workers in "negotiations with employers to set the terms and conditions of employment such as wages, hours of work, and working conditions."<sup>235</sup> In essence, the debate concerns the blurring of lines between management and non-management workers for purposes of representation on behalf of the union. The National Labor Relations Act (Section 8a2) states that legitimate labor unions deal with conditions of employment in a collective bargaining manner. Therefore, employee involvement programs may, in some instances, overstep into union territory.<sup>236</sup> Although, at such plants as Saturn and NUMMI that have a joint union-management team in control, there does not appear to be such a dilemma present.

It is important to note that there are many factors present which play a role in the cost-benefit analysis of overcoming alienation in the automobile industry and methods of

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<sup>235</sup> Peter Cappelli and Nikolai Rogovsky, "Employee Involvement and Organizational Citizenship: Implications for Labor Law Reform and Lean Production," *Industrial and Labor Relations Review*, vol. 51, No. 4 (July, 1998), p. 635.

<sup>236</sup> Peter Cappelli and Nikolai Rogovsky, "Employee Involvement and Organizational Citizenship: Implications for Labor Law Reform and Lean Production," *Industrial and Labor Relations Review*, vol. 51, No. 4 (July, 1998), p. 635.

job enrichment which received inadequate attention or were not mentioned at all. For example, although ergonomics was employed in five of the six case studies, data demonstrating reduced employee injury and fatigue was not available. Also, sufficient data was not found to accurately project the total amount of cost necessary to implement and design job enrichment programs (including plant layout construction, training for specialized duties and tasks, etc) for comparison of each of the six case studies. Additionally, as previously mentioned, a complexity of interests makes it difficult to thoroughly explore the multitude of reasons job enrichment programs are not explored throughout the industry. This data, either not found or nonexistent, has left obvious gaps in the assessment sections of this thesis.

In closure, consider Albert Camus' quote, "Without work, all life goes rotten. But when work is soulless, life stifles and dies."<sup>237</sup> Truly, this captures the essence of alienation as it leads to mental illness, absenteeism, turnover, and a feeling of hopelessness among workers. This has been especially true in the automobile industry which has led many to search for a solution in the application of job enrichment methods. Valuable lessons have been learned; however, it appears that effective sociotechnological systems design is complex in design and implementation with too many variables to truly offer a standard program fitting for all corporate cultures.

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<sup>237</sup> O'Toole, James (Chairman), *Work in America*. (London: MIT, 1973), pp. 186.

**Table A: Job Enrichment Methods of Automobile Manufacturing Plants**

	<b>Kalmar</b>	<b>Trollhattan</b>	<b>Uddevalla</b>	<b>Malmö</b>	<b>Saturn</b>	<b>NUMMI</b>
<b>Work Teams</b>	X	X	X	X	X	X
<b>Autonomy</b>	Semi	Semi	Autonomous	Semi	Autonomous	Collective
<b>Task Rotation/Variety</b>	X	X	X	X	X	X
<b>Approximate Cycle Time</b>	30 minutes	?	3 hours	25 minutes	7 minutes	?
<b>Ergonomics</b>	O	X	X	X	X	X
<b>Feedback</b>	O	O	X	O	X	X
<b>Unionized</b>	?	?	X	X	Joint U/M	Joint U/M
<b>Continuous Training</b>	O	O	X	O	X	X
<b>Profit Sharing</b>	O	O	O	O	X	X
<b>Employee Empowerment</b>	O	O	O	O	O	X
<b>Legend</b>						
X = Method implemented						
O = Method not implemented						
? = No data available						

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