

**FITTING TEAMS TO THE TASK: PRODUCT DEVELOPMENT VS. OPERATIONS  
IMPROVEMENT AT SATURN AND NUMMI**

**Sharon Novak  
Charles H. Fine**

**Sloan School of Management  
Massachusetts Institute of Technology  
Cambridge, Massachusetts 02139**

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**Abstract**

In the automotive industry, Saturn and NUMMI are often touted as exemplars of successful implementation of manufacturing employee involvement. Building on data and extended on-site interviews, this paper explores the differences between the approaches taken at each plant and the relationship between worker involvement and plant performance. Based on this comparison, we offer a model to assess the fit between employee involvement activity emphasis (product development vs. operations improvement) and timescale of the involvement process.

## FITTING TEAMS TO THE TASK: PRODUCT DEVELOPMENT VS. OPERATIONS IMPROVEMENT AT SATURN AND NUMMI<sup>1</sup>

From the 1970's to the present, the achievements of Japanese auto makers such as Toyota, as well as the productive success of the Toyota-General Motors joint venture New United Motor Manufacturing Inc. (NUMMI) has given rise to a great deal of study on the nature of the Japanese competitive advantage. Much of the current management literature has focused on the team-based organization of such firms, arguing that greater involvement of workers in the automotive process has fueled improvements in productivity.<sup>2</sup> This view, that more worker-based responsibility is better for plant productivity, inspired organizational efforts at both Saturn Corporation, a General Motors subsidiary, and the Volvo Uddevalla plant in Sweden.

Does the actual productivity data support this relationship between increased worker involvement and plant performance improvements? In fact, NUMMI has consistently exhibited greater productivity as measured by assembly hours per car than either Saturn or Uddevalla, despite the greater emphasis on worker involvement at the latter two organizations.<sup>3</sup> In response to these differences, some have argued that NUMMI represents a limit to productive levels of worker involvement.<sup>4</sup>

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<sup>2</sup>See, for example, C. Berggren and R. Rehder, "Uddevalla and Saturn: The Quest for Competitive and Humanistic Organization" *The International Executive*, forthcoming

<sup>3</sup>I use assembly hours per vehicle as this is the standard measure of productivity across plants used by the auto industry. See Ward's Automotive Weekly or J.D. Powers Quality Survey for more information on this metric.

<sup>4</sup>See Adler and Cole, "Rejoinder," *Sloan Management Review*, Winter, 1994 Pg. 48

Do differences in worker involvement explain the productive differences between the plants? Is there in fact a limit to the amount of worker involvement that suits the competitive requirements of the auto industry? We argue that the relationship, or “fit” between the scope of worker involvement, project requirements (specifically time frame and complexity), and decision-making processes drives productivity differentials. A great deal of performance measures other than plant productivity could be used to examine the impact of worker involvement. However, our intent is to examine this relationship addressed by the management literature, so we restrict our analysis to this aspect of performance.

The concept of fit from the organizational behavior literature is used to analyze the productive differences between Saturn and NUMMI. Some perspective on the history of worker involvement in the auto industry is presented to explain the current views of the relationship between worker involvement and productivity. We then outline the differences between NUMMI and Saturn. Although both plants may appear similar when viewed from the broad organizational structure and strategy levels, the nature of their decision-making processes as well as the tasks covered by workers differ significantly. We argue that an analysis of these differences reveal that NUMMI has established a fit between its decision-making process and level of worker involvement, and Saturn has not. We suggest that certain projects are less suited for certain decision-making processes, and the extent of worker involvement should be assessed for its “fit” with organizational decision-making processes and task requirements.

## **1. CONCEPT OF FIT**

The concept of fit suggests that organizational characteristics and strategies can be identified which best suit certain competitive environments and help explain success or failure in these areas. Miles and Snow argue that in order to understand firm productivity, one must evaluate the fit among an organization's strategy, structure, and management processes.<sup>5</sup> They argue that successful organizations achieve strategic fit with their market environments and support their strategies with appropriately designed structures and management processes. Tushman and Nadler similarly describe internal management processes in terms of six dimensions of fit.<sup>6</sup> (see Appendix A) They argue that greater congruence among all dimensions of fit will help an organization to be successful. At multiple levels, the authors propose questions for assessment of congruence. In Appendix B we have applied Tushman and Nadler's model to Saturn and NUMMI. In Tushman and Nadler's terms, our analysis takes place at the task level, and we use the two task dimensions, task-informal and task-formal, in particular, to examine the relationship between teaming arrangements and project requirements within the two organizations.

## **2. HISTORY OF WORKER INVOLVEMENT IN THE AUTO INDUSTRY**

Teaming has many definitions in the group literature, with foci on both formal and informal structure of groups. We define teaming as any project in which both management and labor have formal input roles for contributing to the final product.

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<sup>5</sup>Miles, Raymond, E. and Charles C. Snow, "Fit, Failure and the Hall of Fame" California Management Review, Vol. 26, No. 3, 1984 pg. 220

<sup>6</sup>Tushman, Michael and David Nadler, "Organizing for Innovation" California Management Review Vol. XXVII, No. 3 Spring 1986

From the 1920s to the 1970's the automotive industry was largely defined by the dominance of the mass production system, which included an organization structure of hierarchical management and management-labor separation. Over ninety percent of the world auto sales in the 1950s were produced by Detroit's "Big Three" auto makers - General Motors, Ford and Chrysler - a share which had fallen to fifty percent by 1979, and largely due to growth of European and Japanese auto makers. <sup>7</sup>

The 1990 publication of The Machine that Changed The World highlighted the revolution in automotive industrial performance known as "lean production" or the Toyota Production System. The Japanese auto makers, operating flexible batch production systems, produced better quality cars at a lower cost and in shorter development cycles than the Big Three. A key aspect of this system, its proponents claimed, was its management-labor teaming, or the integration of highly trained, multi-skilled shop floor workers into automotive development and control of processes. All workers at Toyota gave input into the operating process and were included in a "continuous improvement" philosophy of production, where the organizational aim was to seek perfection, as represented by zero defects, ever-shortening cycle time and market-driven design. Toyota's system of involving workers encouraged them to actively seek to improve operations, and Toyota has seen many worker-based improvement suggestions lead to productive increases in overall operations. <sup>8</sup>

This approach was a far cry from the view of workers held by the Big Three. In developing mass production, Henry Ford not only invented the concept of interchangeable parts, but interchangeable workers, as well.<sup>9</sup> Until the 1980s,

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<sup>7</sup>Machine that Changed the World, Pg. 44

<sup>8</sup>For detail on worker-based improvements, see "Toyota: A History of the First Fifty Years" Toyota City: Toyota Motor Corporation, 1988

<sup>9</sup>Machine That Changed the World, pg. 50

the division of labor in the auto industry, reflected in the union structure as well, was taken to an extreme, with unskilled union workers focusing on highly specialized, repetitive, menial tasks. There was little informal, and certainly no formal, mode for worker input into operations, which were determined by management.

As the Big Three continued to lose market share to the Japanese throughout the 1980's, there was much debate as to the source of the Japanese competitive advantage. Initially, such teaming and worker involvement was viewed as an organizational alternative restricted to "Japanese" culture. It was argued that the Japanese education system focused on team work, and produced highly skilled workers who worked together "naturally" where the United States philosophy of education was based on individuality and entrepreneurship, producing specialized workers who were unlikely to work in teams. Given the long history of U.S. management-labor conflicts, Japanese-style teaming was seen as an impossibility for the Big Three until the formation of NUMMI.

In 1984, Toyota and General Motors entered into a joint venture, the auto plant in Fremont, California. NUMMI would manufacture small cars (primarily the Geo Prism/Chevrolet Nova and the Toyota Corolla) under the Toyota Production System, including teaming and extensive worker training, using former General Motors workers. NUMMI has been a tremendous success, in terms of plant productivity, car quality and worker satisfaction.<sup>10</sup> The success of NUMMI, in particular its successful extension of Toyota's teaming principles to the American workforce, led to a proliferation of management articles arguing a positive correlation between team-based work and productivity improvements.

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<sup>10</sup>For additional performance data see Adler (1993) as well as Ward's Automotive Weekly

## 2.1 Is More Better?

Building on the success of, researchers such as Christian Berrgren argued for a more “human-centered” model of work, or the view that organizational learning ( and thus, productive improvements) is best served by work forms that give worker teams greater control over traditional management decisions. <sup>11</sup>

Two major experiments that developed out of the human-centered, or “more is better” viewpoint in the early 1980’s are Saturn Corporation and Volvo’s Uddevalla plant. At Volvo’s Uddevalla plant, teams of workers in cells of 10 had full responsibility for the entire vehicle assembly process. Workers set their own pace of work, and rotated jobs. Proponents of Uddevalla’s system argued that it could match Toyota’s lean production performance while providing a more humane environment for workers by giving them even more control over plant operations, and thus more interest in improving the system. NUMMI outperformed Uddevalla by requiring only half as many labor hours to assemble a car as Uddevalla. Uddevalla never achieved-level productivity, and was closed in May, 1993. <sup>12</sup>

Clearly there are many factors which influence productivity, such as technology and capacity utilization. Indeed, some have argued that NUMMI and Uddevalla cannot be compared in terms of productivity because NUMMI produces small cars at near full utilization and Uddevalla produced luxury cars at 50% utilization. <sup>13</sup> It is for these reasons that we focus on the relationship between worker teaming and plant productivity at Saturn and NUMMI, where

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<sup>11</sup>See Berrgren, Christian, “Alternatives to Lean Production” Ithaca, New York: ILR Press, 1992 and R.R. Rehder, “Building Cars as if People Mattered” Columbia Journal of World Business, Summer 1992, pp. 57-70 for this viewpoint.

<sup>12</sup>Data from Table 1, Adler and Cole, “Rejoinder,” Sloan Management Review, Winter, 1994 Pg. 46

<sup>13</sup>See Berggren, Christian, “Point/Counterpoint: vs. Uddevalla” Winter 1994 Volume 35, No. 2 Sloan Management Review pp. 37-49

both plants produce small cars and the level of capacity utilization is comparable.<sup>14</sup>

## **2.2 Is More Worse?**

After Uddevalla's closing, many argued that as team autonomy and decision decentralization were its central focus, this increased emphasis on worker input detracted from Uddevalla's productivity. In a comparison of Uddevalla and NUMMI, Adler and Cole claim:

“ NUMMI shows that continuous improvement does not have to be based on an escalating appropriation of worker's know-how. ..A third assumption built in to the Uddevalla approach and one that underlies much of Western industry is that an increase in individual learning automatically leads to an increase in organizational learning. This is a fundamental fallacy. The Japanese model does not take organizational learning as a given; managers consciously work to create policies and practices that facilitate it. <sup>15</sup>

Whereas Adler and Cole argue that NUMMI represents a limit to worker input, we will use the cases of Saturn and NUMMI to argue that the fit between task requirements and decision-making structure influence the appropriate level of worker involvement.

## **3. SATURN AND NUMMI**

Saturn began production of small cars in 1990, and by 1994, operated at 3.65 workers per car. NUMMI on the other hand, operated at 3.73 workers per car in 1988, four years after its opening, and was at 2.98 workers per car by 1994.

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<sup>14</sup>Data from fieldwork at Saturn and, 1994-1995

<sup>15</sup>Adler, Paul S. and Robert E. Cole, *Designed for Learning: A Tale of Two Auto Plants* Sloan Management Review, Spring, 1993 pg. 92



NUMMI continues to outpace Saturn in both absolute assembly hours and rate of improvement.<sup>16</sup> How are we to understand the performance differences between NUMMI and Saturn? The Saturn business model owes much to NUMMI, and the two systems are similar in many striking ways. Both plants employ former General Motors workers, operators at both NUMMI and Saturn are subjected to rigorous screening and training for their commitment to organizational goals, and at both plants, workers and management supported and articulated the organization's partnership mission.<sup>17</sup> Both plants have similar continuous improvement philosophies. The basic production technology at both plants is the assembly line, and both plants produce a high volume, standardized small car for the North American market. However, NUMMI and Saturn differ along the following key dimensions:

- **Technology**

NUMMI adopted a mature manufacturing process for its car models, one which was already developed and debugged at Toyota's Takaoka plant, whereas Saturn developed entirely new cars with a just - established learning curve for its processes as well as organization.

- **Scope of Worker Involvement**

Worker involvement at the two plants has a different scope. Saturn involves workers in the total car development process, including equipment development and new model development, where workers at NUMMI focus

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<sup>16</sup>Data on and Saturn from The Harbour Report, Harbour and Associates, Inc. 1994.

<sup>17</sup>It is worth noting that Saturn was only able to screen employees for initial plant hirings in 1990, and has accepted workers from a general pool of GM layoffs for its two subsequent hiring rounds. This suggests that Saturn may have less opportunity to control for worker attitudes.

on day to day operations of mature, fully developed models as well as on long-term process improvement opportunities.

- **Decision making Process**

Decision making at Saturn is based on its “total consensus” planning process. Total consensus is the process by which all employees, both management and union, who are involved in a project must “buy-in” or give final approval before the project can be implemented. Total consensus was designed to empower employees and to provide total participation and ownership in the decision making process. In order to ensure employee empowerment, planning is undertaken in teams with each member, management or labor, having an equal vote in approving the process. Workers at Saturn are organized in teams of 18, with one union and one management work unit manager who are functional equivalents of team leaders. Worker responsibilities at Saturn are quality assurance, preventative maintenance, internal job rotation scheduling, work methods and standards as well as rotating participation in new car and equipment development.<sup>18</sup> Work teams set their own standards, which must be agreed upon by consensus.

Worker teams at are organized in groups of four to five workers with a team leader. In contrast to Saturn, NUMMI’s system might be described as “total input”, as NUMMI facilitates and rewards employees for participating in continuous improvement suggestion efforts, but rather than giving all team members an equal vote on projects, at NUMMI project leaders ultimately decide which suggestions to implement.<sup>19</sup> Worker responsibilities are quality assurance,

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<sup>18</sup>On site research, 1994-5, see also ,  
Hommes, Daniel J. , “Transitioning a Maintenance Culture in A Plant”  
LFM Master’s Thesis, MIT, 1994

<sup>19</sup>Adler, Paul S. “The Learning Bureaucracy”: New United Motor Manufacturing, Inc.

preventative maintenance, internal job rotation scheduling, work methods and standards. Work teams set their own standards, but these standards must be approved by engineers.

One might argue that Saturn and NUMMI cannot be compared due to their technology differences. However, if the differences between the two were limited to differences in technology, one would expect a greater, not lesser, rate of improvement from Saturn than, since Saturn's newer system should offer more opportunities for immediate improvement than NUMMI's debugged system. In fact, NUMMI's rate of improvement has exceeded Saturn's throughout their mutual existence.<sup>20</sup> We believe that this productivity improvement differential is better explained by analysis at the task level.

#### **4. ASSESSING FIT AT SATURN AND NUMMI**

##### **4.1 Task-Formal Organization**

Fit at this dimension as measured by Tushman and Nadler is based on an assessment of whether the organizational arrangements are adequate to meet the demand of the tasks. Worker involvement at both NUMMI and Saturn covers ongoing maintenance and quality improvement efforts. Adler states that "NUMMI's innovativeness was not that of a Research and Development department, but given the stable and relatively routine nature of its core task... NUMMI proved very effective at sustaining the relevant forms of innovation."<sup>21</sup> For such ongoing, routine efforts, Saturn and NUMMI's differing structure both

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*Research in Organizational Behavior*, Vol. 15, 1993 Pg. 126

<sup>20</sup>Data from interview with Dan Juliette, Director of Manufacturing, Saturn Corporation, May, 1995. Again, it should be noted that Saturn's rate of improvement was greatly impeded by problems with a new engine and transmission and two new foundries. NUMMI does not manufacture engines, and thus experiences much less complexity in the startup and manufacturing process.

<sup>21</sup>Adler, Paul S. "The Learning Bureaucracy": New United Motor Manufacturing, Inc. *Research in Organizational Behavior*, Vol. 15, 1993 Pg. 167

appear to fit the tasks quite well. Both Saturn and NUMMI have extensive training programs which focus on team-based planning and continuous improvement processes so that workers are well equipped to fulfill their roles of contribution to quality and productivity improvements. Both plants use formal quality circles in order to prepare workers to contribute, and both have reward and incentive structures tied to performance. At NUMMI, however, workers do not participate in body styling and equipment development, which is predetermined by Toyota, where at Saturn they do. As we discuss below, Saturn's program of worker involvement in such highly complex, short - time - frame - planning areas such as equipment and new model development may not fit well with its total consensus approach.

Jay Galbraith argues, "the greater the task uncertainty, the greater the amount of information that must be processed among decision makers during task execution in order to achieve a given level of performance."<sup>22</sup> Jay Lorsch argues that this need for leadership is filled by creating an integrator or project management role, where the project manager carries enough power in the team to integrate and process information.<sup>23</sup> That Saturn covers more complex and uncertain tasks such as new model development with teaming arrangements is not in and of itself a problem, as both Saturn and NUMMI have team leaders who are designed to act as project integrators. However, we argue that these managers play a very different role at the two plants as a result of the interaction between their team structure and decision-making process. Project managers at NUMMI are able to provide the necessary integrator role because NUMMI's total

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<sup>22</sup>Galbraith, Jay "Organization Design: An Information Processing View"  
*Interfaces*, May, 1974 p. 28

<sup>23</sup>Lawrence, Paul and Jay Lorsch, Organization and Environment  
Division of Research, Harvard Business School, 1967 Chapter 3.

input process allows them to have the authority to judge incoming improvement suggestions, and to decide which suggestions to implement.

At Saturn, on the other hand, although projects do have project managers, the equal vote, total consensus requirement does not give project managers the authority to filter ideas and manage projects effectively. If consensus on decisions is not obtained initially, project managers do not have the authority to override other group members, but must pass the decision up to higher and higher levels of teams.<sup>24</sup> Frequently, it becomes very unclear where accountability for decisions rests. Furthermore, there is no clear leadership throughout the planning process, not only because it is difficult to assess responsibility for decisions, but because the consensus requirement has created an atmosphere at Saturn which is highly resistant to management direction. Management is constantly faced with the fear of appearing to “dictate” when trying to follow up on team directives. An employee who attempts to direct planning decisions is often described as “not Saturn-like” and avoided by his or her co-workers. A highly directed plant manager was derided as “too GM-like.” In consequence, it is very difficult to complete projects in a timely manner, and as a result, Saturn has been up to two years late on critical timing projects such as equipment and new model development - precisely the areas that NUMMI does not cover with teaming arrangements.<sup>25</sup>

The difference in project manager roles at NUMMI and Saturn is compounded by their different task requirements. Saturn’s total consensus system extends to the most critical development tasks which are the most uncertain in nature, and thus require the most direction. The result is that the decision-making process prohibits leadership where it is most needed, where

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<sup>24</sup>All Saturn information is from personal interviews, 1994-1995.

<sup>25</sup> There are obviously many reasons other than teaming arrangements which have influenced Saturn’s lateness in critical projects, including financing and design issues.

NUMMI provides direction through project management even when timeliness may not be as essential. As new development projects have a tremendous impact on plant productivity, the lack of fit at this level explains why, in part, Saturn is more likely to lag behind NUMMI in plant performance.

#### **4.2 Task-Informal Organization**

Fit at this dimension as measured by Tushman and Nadler is based on an assessment of whether the informal organizational structure hinders or facilitates task performance. We believe that the consensus decision making requirement has major effects on informal behavior at Saturn which does not fit with its task requirements. Adler quotes a worker at NUMMI :

“NUMMI’s managers are pretty good at considering suggestions when workers make them. They respect worker’s ideas. They will always get back to you with, ‘it’s a great idea,’ or ‘it’s a good idea, but...’ This is what we like to see.”<sup>26</sup>

Managers at NUMMI are able to meet worker expectations by considering ideas, as the process does not promise every team member will see his or her suggestions implemented. We argue that extending the total consensus requirement to new development projects creates a potentially negative effect productivity through its impact on employee expectations. One Saturn team member who has also worked at NUMMI said, “The difference is that at NUMMI you know who is making the ultimate decisions, and you do not necessarily expect them to act on your every suggestion. At Saturn everyone, qualified or not, expects to be part of the ultimate decision, and they will not agree unless they can affect the final outcome.”<sup>27</sup> Managers at Saturn are further hampered in

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<sup>26</sup>Adler, Paul S. “The Learning Bureaucracy”: New United Motor Manufacturing, Inc. *Research in Organizational Behavior*, Vol. 15, 1993 pg. 150

<sup>27</sup>Personal Interview, Saturn Corporation, August, 1994

their need to fulfill an integrator role by the raised expectations created by total consensus. Furthermore, if expectations are not met, employees at Saturn can become disillusioned. One Saturn team member said, "I used to suggest a lot of changes in new equipment, but after a while, I quit suggesting because I didn't think the group was following my ideas."<sup>28</sup>

## **5. LIMITATIONS OF FIT ANALYSIS**

The major criticism of fit analysis is that it is relatively unpredictable and ad-hoc. The majority of work in this area implies that IF the organization is successful, then there has been a good fit, without claiming to predict what strategy and organizational structure will fit future needs. However, we believe that Saturn and NUMMI cases suggest opportunities for a general model with which to structure analysis of the tradeoffs between decision-making structure and levels of worker involvement that are suited to project requirements.

## **6. ASSESSING FIT : A GENERAL MATRIX**

We believe that the Saturn and NUMMI cases suggest the following key proposals for assessing fit at the task level:

- **The need for a project manager/ integrator role is critical for complex tasks**
- **Projects with short time frames create difficulties for consensus-based planning**
- **A total consensus decision making structure can undermine the authority of project leaders**

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<sup>28</sup>Personal Interview, Saturn Corporation, August, 1994

In terms of fit, the Saturn experience suggests that workers can contribute fruitfully to planning and development. A NUMMI-like approach of total input, with project managers who filter suggestions and keep projects on schedule may be very successful if extended to Saturn's new development efforts. We propose the following fit matrix for assessment of worker involvement levels:



## TASK LEVEL FIT MODEL FOR ASSESSING WORKER INVOLVEMENT

	Short Term	Long Term
Basic Operations	<b>Local Empowerment vs Standardized Work</b>	<b>Consensus</b>
New Product or Process Development	<b>Full Input Plus Heavy-weight Project Management</b>	<b>Strategic Planning with Full Input and "near" consensus</b>

The Task Model Matrix suggests the following prescriptions:

- 1. For short-term, ongoing management and control of operations, competing feasible options exist--local empowerment and standardized work.***

Although Adler and Cole claim to put to rest the question of whether the Udevalla production system can compete with Toyota's, we believe that the case is still open. Clearly Toyota's standardized work system and lean production system deserve the praise they receive. However, in highly dynamic settings, the flexibility that comes from local empowerment might overcome the benefits of standards. The work of Mlynarczyk (1994) provides an interesting analysis of these issues in the case of semiconductor manufacturing at Intel.

**2. Use total input decision-making with a “heavy-weight” project manager for short time frame, highly complex tasks like product development projects.**

Saturn’s experience supports the view that some teaming is preferable to the former hierarchical management approach.<sup>29</sup> However, as Deborah Dougherty suggests, in bringing together a team composed of individuals with different perspectives, such as workers and management, it may be very difficult to align perfectly all of viewpoints required for consensus in a highly complex decision setting.<sup>30</sup> Unsurprisingly, Saturn’s total consensus process creates difficulties for timely decision-making. As late designs or equipment have a direct impact on plant operations, and thus, on plant productivity, it may be better for Saturn to implement a NUMMI-like project management structure for short term, new project development. (Clark and Fujimoto certainly provide significant support for this structure, although motivated by somewhat different issues than those discussed here.) Although it is not clear exactly when projects become too complex to be managed by consensus, the need for project management seems clear for the level of complexity inherent in automotive product development.

**3. Total consensus is possible, and may be preferable, for long-term , basic operations**

Miller and Monge argue that , “participation is its own reward” and this view is supported by the fact that Saturn’s approach has engendered both a great deal of employee loyalty and commitment, as well as higher productivity than

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<sup>29</sup>Miller, K.I. and P.R. Monge, “Participation, Satisfaction and Productivity. A Meta-Analytic review” *Academy of Management Review*, Vol. 29 ,1986 pg. 727-753;

For Saturn - GM comparative data, see The Machine That Changed The World

<sup>30</sup>Dougherty, Deborah, “Interpretive Barriers to Successful Innovation in Large Firms” *Organization Science*, Vol. 3 No. 2 May, 1992, pg. 182

other General Motors plants many of which offer far less support for input from for workers.

Adler's view of NUMMI is that allowing even limited worker input at has had a dramatic effect on worker morale and thus on worker incentive to contribute to quality and productivity improvements. We believe this view also holds for Saturn, where workers describe the organization as "the best working environment I have ever experienced."<sup>31</sup> Saturn does, in fact, have a high degree of worker-based quality improvements at the level of ongoing projects, and it is not clear whether there is a clear choice for total consensus or total input at the level of ongoing maintenance and quality improvement efforts. The argument for a total consensus approach is similar to the argument for concurrent engineering teams. Over time, individuals in the group can come to share a common viewpoint, or schema, and attain timely consensus. In this case, as the ultimate outcome of total buy-in guarantees group satisfaction, the Saturn approach may be preferable to NUMMI's total input for employee satisfaction as well as plant productivity. Further research targeted at evaluating levels of worker input at the two plants for such tasks over time could be used to better assess the tradeoffs between the two approaches to decision-making.

***4. For long-term strategy for new products, seek significant input in the strategic planning process.***

Although this case is effectively outside the range of the case settings examined, we rely somewhat on the work of Fine and Whitney (1996) to assert that firms need to engage actively their entire "knowledge workforce" in the domains determined to be core competencies.

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<sup>31</sup>Personal Interview, Saturn Corporation, August, 1994

## **CONCLUSION**

Rather than directly linking the amount of worker involvement with plant productivity, productive teaming levels should be set by assessing the fit between task complexity and time frame with the decision-making processes that support such teaming arrangements. The NUMMI total input decision-making structure (as opposed to total consensus) can be extended to highly complex tasks such as new product development, and in doing so, can support fruitful integration of worker input in such areas. The human-centered model of increased worker involvement, if matched by appropriate decision-making structures, can still help shape the decisions of highly successful organizations.

**APPENDIX A:**  
**NADLER AND TUSHMAN'S CONGRUENCE MODEL <sup>32</sup>**

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<sup>32</sup>Framework Taken from Tushman and Nadler, "Organizing for Innovation"  
California Management Review Vol. XXVII, No. 3 Spring 1986

## APPENDIX B:

### CONGRUENCE MODEL APPLIED TO SATURN AND NUMMI<sup>33</sup>

<b>FIT TYPE</b>	<b>ISSUES</b>	<b>NUMMI</b>	<b>SATURN</b>
Individual-Organization	Extent to which indivs. hold clear or distorted perceptions of organizational goals	worker empowerment supported by management-labor partnership	worker empowerment supported by management-labor partnership
Individual-Task	Extent to which indivs have skills to meet task demands	extensive team and individual training in support of continuous improvement goals	extensive team and individual training in support of continuous improvement goals
Individual- Informal Organization	extent to which indiv. needs are meet by informal goals	socialization process which supports loyalty to organizational goals	socialization process which supports loyalty to organizational goals
<b>Task-Organization</b>	<b>whether organizational arrangements are adequate to meet demands of tasks</b>	<b>team based decision-making supported by team leader allows for timely decision making</b>	<b>consensus-based team planning is an unwieldy process</b>
<b>Task- Informal Organization</b>	<b>whether informal organization structure facilitates task performance</b>	<b>managed expectations, sufficient loyalty</b>	<b>high expectations high loyalty risk of worker disillusionment</b>
Organization- Informal Organization	whether goals and rewards are consistent with those of formal organization	Process suits nature of task and expectations	Short time frame new technology decisions hampered by formal and informal processes

<sup>33</sup>Framework Taken from Tushman and Nadler, "Organizing for Innovation" California Management Review Vol. XXVII, No. 3 Spring 1986