15.660
Strategic Human Resource Management

MIT Sloan School of Management
Two ways of managing

Traditional
- Narrow job definitions
- Hire/Fire
- Adversarial atmosphere
- Managers think, employees execute
- No employee role in governance

High Performance
- Flexible jobs
- Teams
- Joint Problem Solving
- Employee participation in decision-making
- High levels of training
NUMMI

Case Discussion
NUMMI

• NUMMI produces an average of 87 cars/worker vs. approximately 50 for Saturn and Buick City, General Motors’ most productive plants.

• Since 1983, General Motors has spent over $80 billion on automation to improve the quality and productivity of their manufacturing plants.

• In 1998, a 58-day strike at G.M. idled 200,000 workers and cost the company an estimated $2.5 billion.
NUMMI Compared with Other Auto Plants (1986)

<table>
<thead>
<tr>
<th>Plant</th>
<th>Productivity (Hours/Unit)</th>
<th>Quality (Defects/100 Units)</th>
<th>Automation Level (0=none)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honda, Ohio</td>
<td>19.2</td>
<td>72.0</td>
<td>77.0</td>
</tr>
<tr>
<td>Nissan, Tennessee</td>
<td>24.5</td>
<td>70.0</td>
<td>89.2</td>
</tr>
<tr>
<td>NUMMI, California</td>
<td>19.0</td>
<td>69.0</td>
<td>62.8</td>
</tr>
<tr>
<td>Toyota, Japan</td>
<td>15.6</td>
<td>63.0</td>
<td>79.6</td>
</tr>
<tr>
<td>GM, Michigan</td>
<td>33.7</td>
<td>137.4</td>
<td>100.0</td>
</tr>
<tr>
<td>GM, Massachusetts</td>
<td>34.2</td>
<td>116.5</td>
<td>7.3</td>
</tr>
</tbody>
</table>

Toyota’s Commitment to Learning

“All the organizations we studied that are managed according to the Toyota Production System share an overarching belief that people are the most significant corporate assets and that investments in their knowledge and skills are necessary to build competitiveness.”

Steven Spear & Kent Bowen
Harvard Business Review
September-October, 1999
## Training in World Auto Plants

<table>
<thead>
<tr>
<th>Ownership/Location</th>
<th>Training Hours: First 6 Months for New Workers</th>
<th>Training Hours per Year: Workers with &gt;1 Year Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese/Japan</td>
<td>364</td>
<td>76</td>
</tr>
<tr>
<td>Japanese/North America</td>
<td>225</td>
<td>52</td>
</tr>
<tr>
<td>U. S./North America</td>
<td>42</td>
<td>31</td>
</tr>
<tr>
<td>U. S./Europe</td>
<td>43</td>
<td>34</td>
</tr>
<tr>
<td>European/Europe</td>
<td>178</td>
<td>52</td>
</tr>
<tr>
<td>Newly Industrialized Countries</td>
<td>260</td>
<td>46</td>
</tr>
<tr>
<td>Australia</td>
<td>40</td>
<td>15</td>
</tr>
</tbody>
</table>

**SOURCE:** MacDuffie and Kochan, *Industrial Relations*, 1995, p. 156
From the NUMMI Team Handbook

Our HR philosophy guides us in the development of our full human potential to enable us to build the highest quality automobiles at the lowest possible cost by:

- Recognizing our worth and dignity
- Developing our individual performance
- Developing our team performance
- Improving our work environment
NUMMI’s Core Values

- Customer Satisfaction (quality and cost)
- Dignity
- Trust
- Teamwork
- Consistency
- Frugality
- Continuous Improvement
- Simplicity
- Harmony
Mini-Lecture

Teams
Effective Use of Team-Based Systems

- What is a team-based system?
- Costs and benefits of using teams?
- What is the leader’s role in a team-based organization?
- What skills are needed for teams to function effectively?
- How can you introduce a team-based system?
- Overall lessons learned?
What is a Team?

A team is a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable.

John Katzenbach and Douglas Smith, McKinsey & Company
The Wisdom of Teams
Harvard Business School Press, 1993
# Working Groups Versus Teams

<table>
<thead>
<tr>
<th>WORKING GROUP</th>
<th>TEAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Strong, clearly-focused leader</td>
<td>* Shared leadership roles</td>
</tr>
<tr>
<td>* Individual accountability</td>
<td>* Individual and mutual accountability</td>
</tr>
<tr>
<td>* Group’s purpose is same as the organization’s</td>
<td>* Specific purpose for which the team is responsible</td>
</tr>
<tr>
<td>* Individual work products</td>
<td>* Collective work products</td>
</tr>
<tr>
<td>* Runs efficient meetings</td>
<td>* Open-ended meetings for problem-solving</td>
</tr>
<tr>
<td>* Measures performance in terms of larger firm</td>
<td>* Performance measured on team products</td>
</tr>
<tr>
<td>* Discusses, decides, and delegates</td>
<td>* Discuss, decide, and work together</td>
</tr>
</tbody>
</table>
Common Team Responsibilities

- Quality improvement 100%
- Cross-training 85%
- Scheduling (Production) 80%
- Safety 70%
- Process improvement 70%
- Measurement/goal-setting 75%
- Budget/expense control 50%
- Selection 55%
- Coordination with others 50%
- Customers and suppliers 60%
- Performance appraisal 50%

Manz and Sims (1993)
Costs/Benefits of Using Teams

Benefits
- Bring together complementary skills and experiences
- Provides for flexibility
- Social benefits: fun, commitment
- Less resistant to change

Costs
- Coordination costs
- Personal discomfort and conflict
- Diffusion of responsibility (free-riders and social loafing)
- Risk seeking
What is the role of the leader in a team-based system?

- Ask questions
- Get the group to solve problems
- Promote real participation
- Help resolve conflict
- Train others
- Positive reinforcement
- Encourage high performance goals
- Encourage self-evaluation
- Tell the truth, even when it’s disagreeable
- Liaison with higher management
What Effective Team Leaders Do

- Keep purpose, goals, and approach relevant and meaningful
- Build commitment and confidence
- Manage the level and mix of skills
- Manage relationships with outsiders
- Create opportunities for others
- Do real work
Team Development

S = Supervisor

Start - up

Transitional

Experienced

Mature

C. Manz & H. Sims
Business Without Bosses
John Wiley, 1993
What types of skills and training are required for a team-based system?
Training for Team Effectiveness

- Meeting skills, time management
- Conflict management
- Problem-solving, TQM
- Group dynamics, team building
- Change management
- Coaching and feedback
- Business knowledge (e.g., customer service)
- Technical skills
Evidence on Team Effectiveness

- Cost savings (labor, materials)
- Productivity
- Quality
- Customer service
- Speed and cycle time
- Innovation
- Safety
- Decreased absenteeism and turnover
- Decreased worker’s compensation claims
Pros and Cons of a Team-Based Approach?

Pros

Cons
Lessons Learned: Implementing Team-based Systems

- Working Group
- Pseudo-Team
- Potential Team
- Real Team
- High Performance Team

Impact vs. Team Performance
Some Lessons Learned the Hard Way

- Organizations often expect too much, too soon.
- Things often get worse before they get better.
- Managers and supervisors are threatened.
- A new perspective on leadership is required.
- Need to begin with a clear philosophy and purpose.
- Technical people often see themselves as losers.
- Implementation needs careful planning.
- Employees need technical and behavioral skills.
- Greenfield sites are easier than retrofits.
- Continuous training is essential.
- Stability is crucial; turnover is deadly.
- May need new systems - especially MIS.
- Facilitation can help at the beginning.
Takeaways

- Teams need to be driven by a clear vision and purpose--why are we using them?
- Training and group process skills are important for groups to succeed.
- Team-based organizations need team-based systems, culture, and leadership--not just structure.
Another Example

Saturn

Source: Rubenstein and Kochan
Situating Saturn

- Grew out of GM-UAW 1980s workplace experiments with QWL, teams, NUMMI
- GM couldn’t build small cars profitably
- High level of trust built up between UAW leader Don Ephlin & GM’s Al Warren
- Both willing to champion a new approach

Most far-reaching & controversial labor relations & org. design experiment in the U.S of the past quarter century
Saturn’s Evolution

1990-1996:
- Great customer reaction & high satisfaction
- Profits and Productivity--varied with volume
- “A new kind of union” adding value

1996-99:
- Delays & conflicts over new products
- Wilmington plant opens
- Difficult negotiations of decision-making & performance pay.

2000: New Company & Union Leadership

Current challenge:
How to be more integrated in GM and yet retain sufficient independence to sustain the partnership and its competitive advantage.
Lecture

High Performance Work Systems
Adopting High Performance Work Systems

**Characteristics of Innovators**
- Younger
- Compete Internationally
- Part of larger organization
- High skills technology
- Employee oriented values
- “High road”

**Supporting Human Resource Practices**
- Pay for skill
- Gain sharing
- Profit sharing
- Human resource department important
- Training
## PERSISTENCE OF WORK SYSTEMS

<table>
<thead>
<tr>
<th></th>
<th>1997</th>
<th>1992</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>YES</strong></td>
<td>77.7%</td>
<td>22.3%</td>
</tr>
<tr>
<td><strong>NO</strong></td>
<td>49.5%</td>
<td>50.5%</td>
</tr>
</tbody>
</table>

Source: Osterman, Industrial and Labor Relations Review, January 2000
GAINS FROM TRADITIONAL ORGANIZATION

- Economies of scale from long standardized runs
- Control/Predictability
- Minimum training
- Less organizational disruption
POTENTIAL SOURCE OF GAINS

- Tap into workforce ideas and creativity
- Build commitment and effort
- More nimble/flexible
- Eliminate layers (e.g. quality supervisors)
- Speed up and peer pressure
BARRIERS

- Constituencies resist
- Teams are hard to create
- Skepticism of capital markets
- Small and medium firms lack time and resources
QUESTIONS TO ASK IN MAKING CHOICE

✗ How standardized or predictable is the environment?
✗ How flexible is the production technology?
✗ What does it take to recruit and retain employees? Do employees have requisite skills or can they be trained?
✗ How willing are you to create organizational disruption?
Key Measurement Issues

- Definitions of Terms
- Mail/Phone/In-person Surveys
- Sampling Frame of Employers
- Sampling Frame of Occupations
- Penetration Rate
- Report Fraction of Employers or Fraction of Employees
- Response Rate and Bias
Issues in Assessing Performance

- Unit of Analysis
  - Group, Process, Establishment, Firm, Industry, Economy
- Performance Metric
- Time Period of Measurement
- Additional Controls
- Contingency Perspective
- Selections Bias and Fixed Effects
- Direction of Causality
AUTO STUDY METHODOLOGY

- 62 ASSEMBLY PLANTS, 1990
- WORK SYSTEMS: TEAMS, EI GROUPS, JOB ROTATION, SUGGESTIONS RECEIVED AND IMPLEMENTED
- HRM POLICIES: HIRING CRITERIA (EXTENT OF OPENNESS TO NEW SKILLS), CONTINGENT COMPENSATION, TRAINING, STATUS BARRIERS
AUTO STUDY METHODOLOGY

- OTHER CONTROLS: PRODUCT COMPLEXITY, AUTOMATION, USE OF BUFFERS, “JAPAN EFFECT”

- OUTCOMES: HOURS PER VEHICLE, DEFECTS PER 100 VEHICLES

Source: MacDuffie
## GAINS FROM NUMMI

<table>
<thead>
<tr>
<th></th>
<th>FREMONT</th>
<th>NUMMI</th>
<th>TAKAOKA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>43.1</td>
<td>20.8</td>
<td>18.0</td>
</tr>
<tr>
<td>1986</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRODUCTIVITY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONSUMER REPORTS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RELIABILITY INDEX</td>
<td>2.6-3.0</td>
<td>3.6-3.8</td>
<td>3.8-4.0</td>
</tr>
</tbody>
</table>

Source: Krafcik
## Correlations of Productivity and Quality: Autos

<table>
<thead>
<tr>
<th></th>
<th>Productivity</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Systems</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>HRM Policies</td>
<td>0.43</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Source: MacDuffie
PRODUCTIVITY AND QUALITY: AUTOS

REGRESSIONS SUPPORT CORRELATIONS

INTERACTION (BUNDLES) OF HRM/WORK ORGANIZATION ARE MOST POWERFUL PREDICTORS

Source: MacDuffie
WORK ORGANIZATION AND PRODUCTIVITY IN STEEL: I

OUTCOME: PERCENT UP-TIME

SAMPLE: MONTHLY OBSERVATIONS ON 36 FINISHING LINES IN 17 PLANTS WITH STANDARD PRODUCT

HR VARIABLES: TEAMS, HIRING, ROTATION, TRAINING, EMPLOYMENT SECURITY, SECURITY

CONTROLS: VINTAGE, CAPITAL TYPE

Source: Ichniowski, Shaw and Prennushi
WORK ORGANIZATION AND PRODUCTIVITY IN STEEL:II

- METHOD: CLUSTERED HR PRACTICES INTO FOUR GROUPS, FROM MOST TO LEAST TRADITIONAL
- ESTIMATED CROSS SECTION AND FIXED EFFECT REGRESSIONS

Source: Ichniowski, Shaw and Prennushi
WORK ORGANIZATION AND PRODUCTIVITY IN STEEL: III

- MOST TRADITIONAL: UPTIME = 88%
- MOST TRANSFORMED: UPTIME = 98%
- A MOVE FROM LEVEL 2 TO LEVEL 4 MAINTAINED FOR TEN YEARS = $10 MILLION

Source: Ichniowski, Shaw and Prennushi
WORK ORGANIZATION OF CUSTOMER SERVICE REPRESENTATIVES IN TELECOMMUNICATIONS

- SAMPLE OF TEAMS AND TRADITIONAL CSRS IN ONE FIRM

- HELD CONSTANT PERSONAL CHARACTERISTICS

Source: Batt
## RESULTS FOR CSR’S

<table>
<thead>
<tr>
<th></th>
<th>TRADITIONAL</th>
<th>TEAMS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AVERAGE MONTHLY SALES</strong></td>
<td>$5010</td>
<td>5783</td>
</tr>
<tr>
<td>% OBJECTIVES MET</td>
<td>104%</td>
<td>108%</td>
</tr>
</tbody>
</table>

Source: Batt
Conclusion

Next Class:
- The HR Function