

Module 3: Implementation Simulation

Overview and Expected Outcomes – Module 2

■ Overview

- ◆ Simulation Structure
- ◆ Simulation Exercise

■ Expected outcomes

- ◆ Ability to balance short-term and long-term priorities in leading systems change
- ◆ Deeper understanding of interdependencies between social and technical systems
- ◆ Awareness of the impact of strategic choices – with scarce resources – on performance outcomes

Simulation Structure

- Automobile Assembly Plant
- Strategic Choices to be Made Each Quarter Over Three Years (12 rounds)
- Two Models
 - ◆ Current model in production
 - ◆ New model to be launched in Year 3
- Six Major Strategic Choice Categories With Many Options in Each
 - ◆ Product Development (10 options)
 - ◆ Manufacturing Operations – Quality (12 options)
 - ◆ Manufacturing Operations – Workforce (23 options)
 - ◆ Manufacturing Operations -- Support Functions (17 options)
 - ◆ Supply Chain (14 options)
 - ◆ Customer Order Fulfillment (7 options)
- Limited Resources
 - ◆ Can only select 25 options in first quarter (number of options available for selection will change with the market over the three years)
- Balanced Scorecard Outcomes
 - ◆ Quality, Safety, Cost, Schedule, Launch Performance
 - ◆ Initial focus on Quality – First Time Through (FTT) performance (maximum possible is 100% perfect FTT)

Primary Strategic Choice Categories

Product Development

- PD1. Co-location of engineering design teams
- PD2. Training in team-based operations for design teams
- PD3. Machine tooling equipment strategy
- PD4. Design for manufacture
- PD5. Design for quality

Manufacturing Operations -- Quality

- M1. Quality control "andon" system
- M2. Quality inspection
- M3. Quality training
- M4. Quality dimensional control equipment

Manufacturing Operations -- Workforce

- M5. Team implementation
- M6. Team leaders
- M7. Team training
- M8. Team leader training
- M9. Supervisor/superintendent training
- M10. Union-management partnership

Manufacturing Operations -- Support Functions

- M11. Preventative maintenance support teams
- M12. Preventative maintenance procedures
- M13. Material flow systems
- M14. Information system support
- M15. Continuous improvement "kaizen" system
- M16. Targeted interventions

Supply Chain

- S1. Supply chain value add
- S2. Supplier location
- S3. Supplier delivery flow
- S4. e-commerce
- S5. Information transparency

Customer Order Fulfillment

- C1. Customer delivery
- C2. Product variety -- new model
- C3. Product variety -- current model
- C4. Customer contact

Product Development Strategic Choices

PD1. Co-location of engineering design teams

- ❑ PD1a=co-location of powertrain design teams for new model
- ❑ PD1b=co-location of body/frame design teams for new model
- ❑ PD1c=co-location of interior design teams for new model

PD2. Training in team-based operations for design teams

- ❑ PD2a=training for all design teams in group process skills
- ❑ PD2b=training for all design teams in "lean" principles

PD3. Machine tooling equipment strategy

- ❑ PD3a=flexible/programmable tooling for new model
- ❑ PD3b=vendor training in use of flexible/programmable tooling

PD4. Design for manufacture

- ❑ PD4a=production workforce representation on design teams
- ❑ PD4b=current model engineers assists production process improvements

PD5. Design for quality

- ❑ PD5a=Design new product to incorporate in-station process control for quality

Manufacturing Quality Strategic Choices

M1. Quality control "andon" system

- ❑ M1a=installation of "andon" red/yellow/green buttons on engine line
- ❑ M1b=installation of "andon" red/yellow/green buttons on final/trim area

M2. Quality inspection

- ❑ M2a=movement of inspectors from end of line to line-side support on engine line
- ❑ M2b=movement of inspectors from end of line to line-side support in final/trim area
- ❑ M2c=empowering operators to conduct in-station process control on engine line
- ❑ M2d=empowering operators to conduct in-station process control on final/trim area

M3. Quality training

- ❑ M3a=training for engine line in quality control principles
- ❑ M3b=training for final/trim area in quality control principles
- ❑ M3c=training for body shop in quality control principles
- ❑ M3d=training for paint shop in quality control principles

M4. Quality dimensional control equipment

- ❑ M4a=instalation of dimensional control equipment in body shop
- ❑ M4b=instalation of dimensional control equipment in paint shop

Manufacturing Workforce Strategic Choices

M5. Team implementation

- ❑ M5a=restructuring engine line into teams
- ❑ M5b=restructuring body/weld shop into teams
- ❑ M5c=restructuring paint shop into teams
- ❑ M5d=restructuring final/trim area into teams

M6. Team leaders

- ❑ M6a=selection of team leaders for engine line
- ❑ M6b=selection of team leaders for body/weld shop
- ❑ M6c=selection of team leaders for paint shop
- ❑ M6d=selection of team leaders for final/trim area

M7. Team training

- ❑ M7a=team training for engine line
- ❑ M7b=team training for body/weld shop
- ❑ M7c=team training for paint shop
- ❑ M7d=team training for final/trim area

M8. Team leader training

- ❑ M8a=team leader training for engine line
- ❑ M8b=team leader training for body/weld shop
- ❑ M8c=team leader training for paint shop
- ❑ M8d=team leader training for final/trim area

M9. Supervisor/superintendent training

- ❑ M9a=supervisor/superintendent training for engine line
- ❑ M9b=supervisor/superintendent training for body/weld shop
- ❑ M9c=supervisor/superintendent training for paint shop
- ❑ M9d=supervisor/superintendent training for final/trim area

Manufacturing Support Function Strategic Choices

M10. Union-management partnership

- ❑ M10a=shared vision developed by union-management steering committee
- ❑ M10b=establishment of a joint plant implementation team

M11. Preventative maintenance support teams

- ❑ M11a=establishment of maintenance repair teams for engine line
- ❑ M11b=establishment of maintenance repair teams for body/weld shop
- ❑ M11c=establishment of maintenance repair teams for paint shop
- ❑ M11d=establishment of maintenance repair teams for final/trim area

M12. Preventative maintenance procedures

- ❑ M12a=plant-wide preventative maintenance schedule re-invigorated
- ❑ M12b=shift-to-shift maintenance hand-off intervention

M13. Material flow systems

- ❑ M13a=installation of material flow systems in engine line
- ❑ M13b=installation of material flow systems in final/trim area
- ❑ M13c=establishing of "kitting" operation for targeted supplier parts
- ❑ M13d=establishment of parts "marketplace" for targeted supplier parts
- ❑ M13e=appointing supplier contact people on all production teams

M14. Information system support

- ❑ M14a=implementation of information tracking system for quality feedback
- ❑ M14b=implementation of information tracking system for work group issues
- ❑ M14c=implementation of bar-code parts tracking system for material flow

Manufacturing Support Function Strategic Choices

M15. Continuous improvement "kaizen" system

- ❑ M15a=establishment of a continuous improvement suggestion system
- ❑ M15b=dedication of engineering resources to help implement suggestions
- ❑ M15c=dedication of maintenance resources to help implement suggestions

M16. Targeted interventions

- ❑ M16a=Targeted organizational development effort targeted at improving communication on performance measurables
- ❑ M16b=Targeted organizational development effort targeted at improving overall trust and respect in the organization
- ❑ M16c=Targeted organizational development effort targeted at improving the training support infrastructure
- ❑ M16d=Targeted organizational development effort targeted at improving the cost accounting infrastructure
- ❑ M16e=Team building efforts for the management leadership team
- ❑ M16f=Targeted efforts to prepare for executive visits
- ❑ M16g=Targeted efforts to benchmark other organizations
- ❑ M16h=Targeted efforts to prepare for benchmarking visits from other organizations

Supply Chain Strategic Choices

S1. Supply chain value add

- ❑ S1a=Supplier agreement provide engineering design support for new model
- ❑ S1b=Supplier assignment of contact people for production teams

S2. Supplier location

- ❑ S2a=Location 1-3 suppliers in "supplier park" near plant
- ❑ S2b=Location of 4-6 suppliers in "supplier park" near plant
- ❑ S2c=Location of 7-9 suppliers in "supplier park" near plant

S3. Supplier delivery flow

- ❑ S3a=Supplier agreement for more frequent deliveries in smaller batches
- ❑ S3b=Supplier agreement for in-line vehicle sequencing of parts

S4. e-commerce

- ❑ S4a=Agreement of 1-3 suppliers to use on-line pricing and logistics system
- ❑ S4b=Agreement of 4-6 suppliers to use on-line pricing and logistics system
- ❑ S4c=Agreement of 7-9 suppliers to use on-line pricing and logistics system

S5. Information transparency

- ❑ S5a=Agreements with 1-3 suppliers on sharing process improvements gains
- ❑ S5b=Agreements with 4-6 suppliers on sharing process improvements gains
- ❑ S5c=Agreements with 7-9 suppliers on sharing process improvements gains

Customer Order Fulfillment Strategic Choices

C1. Customer delivery

- C1a=Improvements in road and railway logistics system
- C1b=Begin migration from forecast planning to "pull" system for orders

C2. Product variety -- new model

- C2a=Add 5 new options and features for new launch model
- C2b=Add 10 new options and features for new launch model

C3. Product variety -- current model

- C3a="Refresh" current model with 5 new options or features
- C3b="Refresh" current model with 10 new options or features

C4. Customer contact

- C4a=Establish system for customer contact phone calls from workforce