Role of Human Resource Development in Automotive Industry

by

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Vice President of Thailand Automotive Institute

Friday, 21st June 2013 @ BITEC, Bangkok
MRS. CHUREERUT SUWANVITHAYA

VICE PRESIDENT

THAILAND AUTOMOTIVE INSTITUTE
World Automobile Production Yearly 2000-2012

2012 = 80.4 mil.units
(CV 25%: PC 75%)

Hamburger crisis -12%

Source: OICA & FOURIN
Overview of ASEAN Automotive industries

Source: AAF (analyzed by TAI)
CAGR = Compound Annual Growth Rate
Motor vehicle world in use forecast to 2045

Source: David ward (2011)
Motor vehicle production ranking in 2012

Motor vehicle production total = 84 million

Source: OICA
Note: *Canada data from Automotive news and **Thailand data from TAIA
Forecast Production in 2015:

- **Capacity**: 3,140,000 Units
- **Forecast Production**: 2,500,000 Units

2011:
- **Capacity**: 2,240,000 Units
  - PU & Commercial: 60%
  - PC: 40%

2015:
- **Capacity**: 3,140,000 Units
  - PU & Commercial: 46%
  - PC: 54%

ECO Cars
The structure of the Thai Automotive Industry:

- **Assembler (Car 13 Co., Motorcycle 7 Co.)**
  - 100,000 workers

- **Tier 1 (Total 635 Companies)**
  - 250,000 workers

- **Tier 2,3 (1,700 Companies)**
  - 175,000 workers

According to the data updated in July 2010 by TAI:

- LSEs (Large Scale Enterprises)
  - 250,000 workers

- SMEs (Small & Medium Enterprises)
  - 175,000 workers

**[LSEs : Large Scale Enterprises] [SMEs : Small & Medium Enterprises]**
By Skills
- Manufacturing: 50%
- Mechanic: 26%
- Engineering: 7%
- Electrical: 5%
- Electronics: 7%
- Account/Admin.: 5%
- Others: 1%

By Job Level
- Staff: 74%
- Technical: 7%
- Supervisor: 7%
- Expert: 5%
- Engineer: 4%
- Executive: 3%

By Education Level
- Secondary-High School: 50%
- Vocational Certificate: 15%
- Diploma: 25%
- Degree: 10%

Human resources development

Source: Thailand Automotive Institute (TAI)
The projected demand for workers in the automotive industry

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Production (Million units)</th>
<th>Worker use to Automotive Industry</th>
<th>Productivity in manufacturing (vehicle / person / year)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>2553</td>
<td>1.6</td>
<td>457,000</td>
<td>3.5</td>
<td>Eco Car, Nissan, Ford Flesta</td>
</tr>
<tr>
<td>2554</td>
<td>1.7</td>
<td>472,200</td>
<td>3.6</td>
<td>Eco Car : Honda</td>
</tr>
<tr>
<td>2555</td>
<td>1.9</td>
<td>513,500</td>
<td>3.7</td>
<td>Ford เน้นเพื่อการส่งออก Eco Car : Mitsubishi, Suzuki GM ส่งออก P/U</td>
</tr>
<tr>
<td>2556</td>
<td>2.1</td>
<td>552,600</td>
<td>3.8</td>
<td>Eco Car : TOYOTA</td>
</tr>
<tr>
<td>2557</td>
<td>2.2</td>
<td>564,100</td>
<td>3.9</td>
<td>Export &gt; 1.3 Unit</td>
</tr>
<tr>
<td>2558</td>
<td>2.3</td>
<td>575,000</td>
<td>4.0</td>
<td>AEC</td>
</tr>
<tr>
<td>2563</td>
<td>&gt;2.5</td>
<td>&gt;600,000</td>
<td>4.5</td>
<td>Goal : Top 5 ของประเทศส่งออก</td>
</tr>
</tbody>
</table>

Source: Thai Auto Parts Industry Association
The number of workers in the automotive industry 2011

<table>
<thead>
<tr>
<th>Education</th>
<th>Number of Worker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Motor Vehicles Production</td>
</tr>
<tr>
<td>Secondary school Or Less</td>
<td>17,204</td>
</tr>
<tr>
<td>High school</td>
<td>11,778</td>
</tr>
<tr>
<td>Vocational Certificate</td>
<td>6,827</td>
</tr>
<tr>
<td>Diploma</td>
<td>10,734</td>
</tr>
<tr>
<td>Bachelor's degree or higher</td>
<td>12,387</td>
</tr>
<tr>
<td>Unknown</td>
<td>454</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>59,384</strong></td>
</tr>
</tbody>
</table>

Source: Office for National Statistics.
### Shortage of manpower and talent in the automotive industry

<table>
<thead>
<tr>
<th>Types of manpower</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive</td>
<td>26,700</td>
</tr>
<tr>
<td>Engineer</td>
<td>37,800</td>
</tr>
<tr>
<td>Technician</td>
<td>45,600</td>
</tr>
<tr>
<td>Admin.</td>
<td>112,900</td>
</tr>
<tr>
<td>Production line manpower</td>
<td>701,400</td>
</tr>
</tbody>
</table>

ที่มา .. สมาคมวิศวกรรมยานยนต์ไทย
VISION 2021
“Thailand is a global green automotive production base with strong domestic supply chains which create high value added for the country”

Strategic Plan
(3 COEs + 2 ENVs)

COE-1
Research and Technology Development
- Alternative energy
- Light weight vehicles
- Vehicle safety
- Advanced production technology

COE-2
Human Resources Development
- Integrated AHRD System Development
- Capability upgrading
- AHRD Alliance

COE-3
Entrepreneur Strength Enhancement
- Productivity Improvement
- Cluster/Supply chain Network
- Green manufacturing

ENV-1
Infrastructure
- Testing and R&D Centers
- Automotive Information Centers
- Automotive Academy

ENV-2
Government Policy
- Policy Integration
- Policy Research Support
- Promote Investment Promotion for Green Products and Suppliers
- Branding for REM

ENV = Good Business Environment
COE = Center of Excellence
Strategy of Human Resource Development in Automotive Industry

- Increasing human resources
- Building knowledge
d- Skill and expertise development
- Attitude improvement
- Knowledge transfer
TAI role of Human Resource development in the automotive industry

Automotive Human Resource Development Program: AHRDP

**THAI Government**
- MOI (Ministry of Industry)
- MOL (Ministry of Labour)
- DIP (Department of Industrial Promotion)
- DSD (Department Of Skill Development)

**THAI Private sector**
- FTI (The Faderation of Thai Industries)
- TAPMA (Thai Autoparts Manufacturers Association)
- TGI (Thai - German Institute)

**JAPAN Government**
- METI (Ministry of Economy, Trade and Industry)
- JETRO (The Japan External Trade Organization)
- JICA (Japan International Cooperation Agency)
- JCC (Japanese Chamber of Commerce)

**JAPAN Private sector**
- DENSO: Mind Management & Manufacturing Skill
- HONDA: Mold&Die
- NISSAN: Skill Certification System
- TOYOTA: Toyota Production System

Duration: 2006 - 2011

Co-organized by:
- THAILAND AUTOMOTIVE INSTITUTE
- Reed Tradex
# Automotive Human Resource Development Program: AHRDP

## Summary

<table>
<thead>
<tr>
<th>Curriculum</th>
<th>Examiner</th>
<th>Trainer</th>
<th>Trainee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mind Management &amp; Manufacturing Skill (DENSO)</td>
<td></td>
<td>60</td>
<td>2,643</td>
</tr>
<tr>
<td>Mold &amp; Die (HONDA)</td>
<td>-</td>
<td>26</td>
<td>2,096</td>
</tr>
<tr>
<td>Skill Certification System (NISSAN)</td>
<td>132</td>
<td>189</td>
<td>453</td>
</tr>
<tr>
<td>Toyota Production system -TPS (TOYOTA)</td>
<td>-</td>
<td>43</td>
<td>1,959</td>
</tr>
</tbody>
</table>

- 233 SME developed

<table>
<thead>
<tr>
<th></th>
<th>Examiner</th>
<th>Trainer</th>
<th>Trainee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>132</td>
<td>318</td>
<td>7,151</td>
</tr>
</tbody>
</table>
### Mind Management Courses
1. TQM for management
2. TQM Problem Solving
3. TWI – JR (How to relate person)
4. TWI – JI (How to instruct work)
5. Workmanship (WSTC)
6. Teaching Technique

### Manufacturing Skill Courses
7. General Basic manufacturing skill
8. Basic electric system
9. Basic mechanical system (Monozukuri)
10. Knowledge Sensor
11. Machine Assembly

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**DENSO**

- Mind Management
  - 6 Courses
- Manufacturing Skill
  - 5 Courses
<table>
<thead>
<tr>
<th>Design (9 Course)</th>
<th>Finishing (9 Course)</th>
<th>NC Data Machining (3 Course)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Fundamental of Die Forming</td>
<td>17. Die Spotting Technique</td>
<td>11. CAD Data for Die Manufacturing</td>
</tr>
<tr>
<td>9. CAE Simulation</td>
<td>24. CAM Die Finishing Process</td>
<td></td>
</tr>
</tbody>
</table>

- 10. CAD/CAM Fundamental
- 11. CAD Data for Die Manufacturing
- 12. CAM Data for Die Manufacturing
- 14. Basic Machining for Die Parts
- 15. Advance Machining for Die Parts
- 16. Die Finishing Technique
- 17. Die Spotting Technique
- 18. Forming Process Defection on panel
- 19. Draw Die Finishing Process
- 20. Trim Die Finishing Process
- 22. Hemming Die Finishing Process
- 23. Die Quality Process
- 24. CAM Die Finishing Process
NISSAN
Skill Certification System
17 Operation  51 level

1. Metal Press Work/Stamping : Level 1-3
2. Plastic Injection : Level 1-3
3. Ferrous Casting : Level 1-3
4. Machining Lathe : Level 1-3
5. Machining Milling : Level 1-3
6. Die & Mold Finishing : Level 1-3
7. Mechanical Assembly Finishing : Level 1-3
8. Lathe with Numerical Control : Level 1-3
9. Milling with Numerical Control : Level 1-3
10. Mechanical Drawing by Handwriting : Level 1-3
11. Mechanical Drawing by CAD : Level 1-3
12. Electronics Device Assembly : Level 1-3
13. Sequence Control (PLC) : Level 1-3
14. Pneumatic Circuits and Apparatus Devices Assembly : Level 1-3
15. Hydraulic System Adjustment : Level 1-3
16. Mechanical Maintenance : Level 1-3
17. Electrical Maintenance : Level 1-3
Toyota production system
5 Courses

1. TPS concept
2. Work site control
3. Continuous flow
4. Standardized work
5. Pull system
Automotive Human Resources Development Institute Project: AHRDIP

Under joint collaboration JTEPA (Japan – Thailand Economic Partnership Agreement)

THAI Government
- MOI (Ministry of Industry)
- OIE (Office of Industrial Economics)
- DIP (Department of Industrial Promotion)
- DTN (Department of Trade Negotiations, Ministry of Commerce)
- DEAA (Department of East Asian Affairs, Ministry of Foreign Affairs)

THAI Private sector
- FTI (The Federation of Thai Industries)
- TAPMA (Thai Autoparts Manufacturers Association)
- TGI (Thai-German Institute)
- TPA (Technology Promotion Association (Thailand-Japan))
- TDIA (Thai Tool and Die Association)
- ISIT (Iron and Steel Institute of Thailand)

Duration 2012 – 2016

AHRDIP

JAPAN Government
- METI (Ministry of Economy, Trade and Industry)
- JETRO (The Japan External Trade Organization)
- JICA (Japan International Cooperation Agency)
- JCC (Japanese Chamber of Commerce)
- MOI (Ministry of Industry)
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- DEAA (Department of East Asian Affairs, Ministry of Foreign Affairs)

JAPAN Private sector
- HIDA
  1. R&D (VA/VE)
  2. Testing (Material Evaluation)
  3. Manufacturing (Production Preparation)
  4. Manufacturing (Mold & Die)
- TOYOTA: New Toyota Production System

Co-organized by: Reed Tradex
Automotive Human Resources Development Institute

Project : AHRDIP

Curriculums

1. R&D (VA/VE)
2. Testing (Material Evaluation)
3. Manufacturing (Production Preparation)
4. Manufacturing (New Toyota Production System)
5. Manufacturing (Mold & Die)
Automotive Human Resources Development Institute Project: AHRDIP

Training

- R&D (VA/VE)
- Testing (Material Evaluation)
- Manufacturing (Production Preparation)
- Manufacturing (New Toyota Production System)
- Manufacturing (Mold & Die)
JCC AHRD committee:

TOYOTA, HONDA, ISUZU, NISSAN, MITSUBISHI, AAT, DENSO, NHK SPRING, STANLEY etc

Experts from Japan

Master trainers from *JCC AHRD committee (R&D, Mfg) and from ISIT (Testing). University lecturers can become additionally.

Trainees from Thai auto parts makers.

Trainees from Thai auto parts makers.

*JCC AHRD committee:

TOYOTA, HONDA, ISUZU, NISSAN, MITSUBISHI, AAT, DENSO, NHK SPRING, STANLEY etc

Automotive Human Resources Development Institute Project : AHRDIP

Concept

(fy2012)

(fy2013 ~ fy2016)
2003 - 2005  Skill Certification System for Automotive Industry

2006 - 2011  Automotive Human Resource Development Program : AHRDP

Develop to 132 Examiner, 318 Trainer, 7151 Trainee

2012-2016 Automotive Human Resources Development Institute Project : AHRDIP

**AHRDIP objective:**
1. To develop high standard training system and curricula
2. To develop Thai trainer
3. To enhance effectiveness of skill training
4. To establish a HRD Center to support the development of personnel in Manufacturing, testing and R&D

**Goals**
- Manufacturing: 1,000 trainers and 255,000 personnel;
- Testing: 200 trainers and 30,000 personnel;
- R&D: 100 trainers and 15,000 personnel
Automotive Human Resources Development Institute Project: AHRDIP

Forecast
Production in 2015
2,500,000 Units

2012 Production Ranking No. 10
2,240,000 Units

Human Resources Development

AHRDIP's Goals

Manufacturing: 1,000 trainers
255,000 personnel

Testing: 200 trainers
30,000 personnel

R&D: 100 trainers
15,000 personnel
## World Competitiveness Index 2012-2013

<table>
<thead>
<tr>
<th>Rank by Country</th>
<th>Rank by Manufacturing</th>
<th>Rank by HRD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Switzerland</td>
<td>USA</td>
</tr>
<tr>
<td>2</td>
<td>Singapore</td>
<td>Switzerland</td>
</tr>
<tr>
<td>3</td>
<td>Finland</td>
<td>Hong Kong</td>
</tr>
<tr>
<td>4</td>
<td>Sweden</td>
<td>Sweden</td>
</tr>
<tr>
<td>5</td>
<td>Netherland</td>
<td>Singapore</td>
</tr>
<tr>
<td>6</td>
<td>Germany</td>
<td>Norway</td>
</tr>
<tr>
<td>7</td>
<td>USA</td>
<td>Canada</td>
</tr>
<tr>
<td>8</td>
<td>England</td>
<td>UAE</td>
</tr>
<tr>
<td>9</td>
<td>Hong Kong</td>
<td>Germany</td>
</tr>
<tr>
<td>10</td>
<td>Japan</td>
<td>Qatar</td>
</tr>
</tbody>
</table>

Source: WEF  | Source: IMD | Source: Deloitte | Source: UNDP
# ASEAN Competitiveness Index 2012-2013

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<tbody>
<tr>
<td>1 Singapore</td>
<td>Singapore</td>
<td>Singapore</td>
</tr>
<tr>
<td>2 Malasia</td>
<td>Malaysia</td>
<td>Thailand</td>
</tr>
<tr>
<td>3 Thailand</td>
<td>Thailand</td>
<td>Malaysia</td>
</tr>
<tr>
<td>4 Indonesia</td>
<td>Phillipines</td>
<td>Indonesia</td>
</tr>
<tr>
<td>5 Phillipines</td>
<td>Indonesia</td>
<td>Vietnam</td>
</tr>
</tbody>
</table>

Source: WEF
Source: IMD
Source: Deloitte
Source: UNDP
Thank You…