Advanced diploma in procurement and supply

Improving competitiveness of supply chains

CASE STUDY
INSTRUCTIONS FOR CANDIDATES

The pre-released case study examination is designed to assess your ability to apply the relevant theories, principles and techniques associated with the unit content to a realistic business situation.

The examination is a three hour open-book examination. The examination questions will test each of the learning outcomes from the unit content.

You will be expected to demonstrate your knowledge and understanding of relevant theoretical principles, concepts and techniques; to apply these appropriately to the particular situation described in the case study and; above all, to make sound decisions. You will not gain marks by writing a general essay on the topic. Prepared notes may not be included as part of the answer.

Please note that all work should be your own. Copying or plagiarism will not be tolerated and could result in no marks being awarded. If quotes or short extracts are used they should be attributed or the source of the information identified.

You should acquaint yourself thoroughly with the case study before the examination. You must take your copy of the case study into the examination.
THE TOYOTA MOTOR CORPORATION: A HISTORY OF CONTINUOUS IMPROVEMENT?

Introduction

In July 2012, 77 years after automobile production began; the Toyota Motor Company manufactured its 200 millionth car. Toyota has been positioned in the automotive industry at number three in the world, by annual production volume (2011) and number two car company in the world, by revenue (2012). It is a remarkable achievement for any company to sustain such success and Toyota's ambitions have not stopped. In the year 2013, Toyota targeted a production of 10 million units. This production volume would be a first for the automotive industry and place Toyota as Number one in the world.

The Toyota Motor Company is reported to be the world's 11th largest company and employs approximately 325,000 people worldwide. It is part of the Toyota Group conglomerate and includes the vehicle brands of Lexus, Daihatsu, Scion and Hino Motors within its portfolio. Toyota’s Mission Statement (2013) is as follows:

“Toyota will lead the way to the future of mobility, enriching lives around the world with the safest and most responsible ways of moving people.

Through our commitment to quality, constant innovation and respect for the planet, we aim to exceed expectations and be rewarded with a smile.

We will meet our challenging goals by engaging the talent and passion of people, who believe there is always a better way.”

www.Toyota-global.com

This case study considers the history, context, philosophy and supply chain operations of Toyota and the recent challenges it has faced.

Company History

Kiichiro Toyoda founded the Toyota Motor Company as a spin off from Toyota Industries in 1937, which was established by his father. Engine and vehicle production had been under the control of Toyota Industries for three years before the formation of the Toyota Motor Company. Today Toyota Motor Company’s headquarters, and many would say its heart, remains in Japan in the city of Aichi. It has also built up satellite offices throughout the world to deal with its large-scale global operations.

From 1947 Toyota’s popular small cars were originally marketed under the brand name ‘Toyopet’ and included light commercial derivatives and original versions of the Corona and Crown, which have endured as model names. The Toyopet name was dropped, however, when Toyota entered the American Market in 1957 (with the flagship model the Crown) but was retained in other markets.

In 1964 the United States government introduced 25% import duty to protect domestic manufacturers. This increased the relative price of Toyota’s vehicles. However, some advantage was gained for Toyota with the later 1973 oil crisis, with its fuel-efficient vehicles becoming more appealing than many domestic models. By the 1990s Toyota had addressed the issue of import duties by setting up local manufacturing facilities in major overseas markets. This led to global production and supply chain operations.

From 1989 onwards, with the creation of the Lexus brand and across other Toyota brands, the company expanded its vehicle portfolio with the introduction of larger and more luxurious vehicles and SUVs (Sport Utility Vehicles, which were four-wheel-drive). This gave the company an extensive product range and broader international and market segment appeal. Toyota continued to push forward with technology developments and in 1997 launched the Prius, which was to become the world’s best-selling hybrid car (with a petrol and electric drive train).
In 2002 the company entered a Formula One team, ‘Panasonic Toyota Racing’, racing two cars in the Championship. Despite some previous successes at Le Mans for circuit racing and in the World Rally Championship the team, it failed to win a single of its 140 grand prix races. Toyota withdrew from the sport in 2009 but with rumours of a return in 2013/2014.

Partnerships and collaborations are a feature of the automotive industry and Toyota has proved to be no exception here. In 2002 Toyota established a partnership with Peugeot and Citroen in Europe. This coincided with the start of production in France (including the assembly of the best-selling small car the Yaris). Amongst other developments this relationship produced a town car (the Aygo) with equivalent Peugeot and Citroen models.

In the first quarter of 2008 Toyota briefly became the largest automotive manufacturer in the world. However, a series of set-backs arose for the company in 2009 and 2010 with product recalls and associated negative publicity. Additionally, an earthquake in Japan in 2011 disrupted supply chain activity and delayed production because of parts shortages. Again in 2012 product recall issues blighted company operations.

The World Automobile Industry Context

World Output
The International Organization of Motor Vehicle Manufacturers was founded in Paris in 1919. It is known as the “Organisation Internationale des Constructeurs d'Automobiles” (OICA) and its mission is to represent the interests of car and commercial vehicle manufacturers throughout the world. The annual figures it produces provide a clear overview of the vast scale of global automotive manufacturing operations. In 2012 it noted that over 84 million cars and commercial vehicles were produced globally. More than 19 million of these were produced in China, and ten million in the USA.

An increase in annual automotive manufacturing output of 5.3% was recorded in 2012 despite difficult economic conditions across the world. The USA, Russia, Japan, India, Mexico, Thailand, Slovakia and Malaysia all saw double-digit percent increases in production output. In contrast Egypt, Iran, Poland, Slovenia, France, Germany and Sweden were notable examples of where small operations were dwindling and larger operations were being hit by adverse economic factors. Some analysts argued that the market was suffering from overcapacity.

Though the USA had been the largest manufacturing country by vehicle volume up until the 1980s, it was later overtaken by Japan and most recently by China.

Budget Products
Driven by increasing economic wealth and a large population India, like China, represents a rapidly expanding market with large potential for future sales. Tata, an Indian manufacturer, has responded to this opportunity with the development of a budget city car, the Nano. The £2,000 price tag represents unprecedented value and is bringing motoring to the masses of India. With India now seen as a viable market, competitive manufacturers are concerned that early buyers of this car will ‘trade up’ within the same brand.

Harmonisation
Harmonisation (alignment or standardisation) of vehicle regulations is seen as necessary to reduce trading barriers and to avoid unnecessary development costs accumulating.

The regulation harmonisation process is driven through the United Nations under the World Forum for Harmonisation of Vehicle Regulations and its groups of government and industry experts working on new “GTRs” (Global Technical Regulations). Harmonisation cuts down on technical and product variation costs for manufacturers when dealing across world markets.
Economic Significance
The Organization for Economic Cooperation and Development (OECD) is an organisation which is committed to promoting a free market economy globally. Member countries are predominantly within Europe, North America, Australasia and Scandinavia and also include Japan and South Korea. Most member countries may be classed as ‘high-income economies’ which have been associated with higher consumer spending, including the purchase of automobiles.

The OECD notes the automotive industry as being of significant economic importance to its member states, accounting for around 5.5% of median economy industrial output. Whilst this may appear to be a relatively small amount of economic activity the volatile nature of output for the industry has shown to have a marked impact upon overall economic performance.

In May 2011 the OECD reported an overall downturn in the automotive industry, which particularly hit Japan (resulting in an estimated GDP loss of 2.5% in that quarter), China (0.5%) and the USA (0.1 to 0.2%). In Japan much of this downturn was attributed to the impact of a large earthquake in March 2011 that resulted in a Tsunami. These events significantly disrupted production operations. Residual concerns and effects from the 2009 world financial crisis also played a strong part in this position.

### Table: 1 The Top Automobile Manufacturers by Volume (Revenue Indicated)

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The General Motors Group</td>
<td>$152</td>
</tr>
<tr>
<td>2. Volkswagen Audi (VAG)</td>
<td>$250</td>
</tr>
<tr>
<td>3. Toyota</td>
<td>$226</td>
</tr>
<tr>
<td>4. Hyundai Motor Group</td>
<td>$73</td>
</tr>
<tr>
<td>5. Ford Motor Company</td>
<td>$134</td>
</tr>
<tr>
<td>6. Nissan</td>
<td>$98</td>
</tr>
<tr>
<td>7. Fiat SPA</td>
<td>$106</td>
</tr>
<tr>
<td>8. PSA Peugeot-Citroen</td>
<td>$72</td>
</tr>
<tr>
<td>9. Honda Motor Company</td>
<td>$101 (Group)</td>
</tr>
<tr>
<td>10. Renault</td>
<td>$54</td>
</tr>
</tbody>
</table>

*http://www.1reservoir.com/awow-8

It is interesting to note that both BMW and Daimler met or exceeded revenues of $100 billion ($100 billion and $148 billion respectively) but do not appear in the top ten by volume. This reflects the premium market positioning of the products and associated premium pricing policy.

Japanese Production Concentration
Japanese car production is dominated by ‘the big six’; Toyota, Honda, Nissan, Mitsubishi, Mazda and Suzuki. In the year 2000 over 60% of Japanese car and commercial vehicle production by these companies was undertaken in Japan. By 2009 this figure had fallen to 42.6% (OICA, 2010) with the most significant growth of production activity in the USA and China. China notably undertook a large amount of final assembly activity. This dispersal of production is a growing phenomenon for the industry, with companies trying to benefit from market access and cost advantages of location. However, for Japanese manufacturers around 40% of materials and components are still sourced from within Japan, irrespective of final assembly location.

Developing Technology
Concerns over the availability of fossil fuels have led mainstream manufacturers into the development of more economical engines and alternative sources of power such as hydrogen fuel-cell technology.

Within Europe there has been a continuing shift towards diesel powered vehicles, despite the concerns over harmful emissions. Manufacturers have been dealing with increasing environmental legislation which addresses vehicle emissions and have been working hard to improve fuelling and exhaust systems.
In North America petrol, or gasoline as it is known within that market, is still the dominant fuel and so hybrid vehicles are gaining interest there. Hybrid vehicles use petrol engines and electric propulsion, the latter generally for use at lower speeds and shorter distances (such as in urban settings).

Some manufacturers including Mitsubishi and Renault have released all electric propulsion vehicles, known as ‘plug-ins’. These have gained some initial market interest, supported by a favourable taxation position and, in some cases, government backed purchase incentives. However, consumer concerns still exist over the distance range of the vehicles and the time required to recharge the batteries. Much of the research in this field is therefore focusing upon the battery technology to increase the distance range, reduce the charge time and to reduce the weight of the battery packs.

Overall, it is desirable to make vehicles lighter; to improve performance, to reduce energy requirements for propulsion, and to save fuel. There issue associated with safety standards and associated equipment is that it increases vehicle weight. Therefore collision avoidance and pedestrian impact safety systems continue to be a key area for research and design investment. In order to provide more rigid and protective safety structures and devices in cars, weight is being added to vehicles. Along with rising expectations of features such as air conditioning and sound systems this has led to a general increase in vehicle weight. Manufacturers are trying to address this through the sourcing of alternative materials as well as improved component design.

The costs of developing a new chassis (or ‘platform’) for a vehicle also represent a substantial investment running into many millions of pounds. To maximise cost competitiveness the chassis and components such as braking, suspension and electrics is often shared across vehicle models and brands. An example of this is the Volkswagen (VW) Audi Group and the commonality of the VW Golf chassis to coupes, hatchbacks, estates, MPVs (multi-purpose vehicles) both within VW and also across the SEAT, Audi and Skoda models of the group.

Environmental concerns are important for vehicle manufacturers to address. These apply not only in vehicle usage but also within the manufacturing process (which is energy intensive) and disposal of the vehicle at its end of life. Whilst some of this is being driven by legislation it is also the case that rising energy costs and the need to source cost-effective materials for components are also critical to competitiveness.

Whilst most major manufacturers are dealing with the environmental agenda in similar ways, each manufacturer also has its own unique projects attempting to create competitive advantage. Examples of this include Toyota’s ‘Smart-Grid’ concept, which looks at how to integrate electric vehicle charging, with ‘green’ power generation, and energy provision infrastructure. This high-tech idea utilises cutting edge information technology to bring together a number of systems to achieve power distribution and overall network connectivity between home, vehicle, office and power generation facilities.

Toyota’s Global Vision (March, 2011) looks at how technology can facilitate an integrated transport system connecting cars, public transport, route planning, energy management (with links to the home), cooperation between vehicles, parking, multi-mode travel, driver support, disaster recovery and breakdown support. It is an ambitious vision but the research associated will have far-reaching opportunities for application on a smaller scale irrespective of the success of the overall project.

http://www.toyota-global.com/

**Toyota Production System**

Toyota’s long-term success has been attributed to the development of the ‘Toyota Production System’. This approach drives costs down and improves quality. The company captures this concept relatively simply as follows:

“A production system which is steeped in the philosophy of ‘the complete elimination of all waste’ imbuing all aspects of production in pursuit of the most efficient methods.” Toyota Motor Corporation’s vehicle production system is a way of “making things” that is sometimes referred to as a “lean manufacturing system” or a “Just-in-Time (JIT) system,” and has come to be well known and studied worldwide.
Toyota Motor Corporation’s vehicle production system is a way of “making things” that is sometimes referred to as a “lean manufacturing system” or a “Just-in-Time (JIT) system,” and has come to be well known and studied worldwide.

This production control system has been established and based on many years of continuous improvements, with the objective of “making the vehicles ordered by customers in the quickest and most efficient way, in order to deliver the vehicles as quickly as possible.”

The Toyota Production System (TPS) was established based on two concepts: The first is called “jidoka” (which can be loosely translated as “automation with a human touch”) which means that when a problem occurs, the equipment stops immediately, preventing defective products from being produced; The second is the concept of “Just-in-Time,” in which each process produces only what is needed by the next process in a continuous flow.

Based on the basic philosophies of jidoka and Just-in-Time, the TPS can efficiently and quickly produce vehicles of sound quality, one at a time, that fully satisfy customer requirements.

**Jidoka**

- **Highlighting/visualization of problems** –
  
  Quality must be built in during the manufacturing process! –

  If equipment malfunction or a defective part is discovered, the affected machine automatically stops, and operators cease production and correct the problem.

  For the Just-in-Time system to function, all of the parts that are made and supplied must meet predetermined quality standards. This is achieved through jidoka.

  1. Jidoka means that a machine safely stops when the normal processing is completed. It also means that, should a quality / equipment problem arise, the machine detects the problem on its own and stops, preventing defective products from being produced. As a result, only products satisfying quality standards will be passed on to the following processes on the production line.

  2. Since a machine automatically stops when processing is completed or when a problem arises and is communicated via the “andon” (problem display board), operators can confidently continue performing work at another machine, as well as easily identify the problem’s cause to prevent its recurrence. This means that each operator can be in charge of many machines, resulting in higher productivity, while continuous improvements lead to greater processing capacity.

**Just-in-Time**

- **Productivity improvement** –
  
  – Making only “what is needed, when it is needed, and in the amount needed!”

  Producing quality products efficiently through the complete elimination of waste, inconsistencies, and unreasonable requirements on the production line.

  In order to deliver a vehicle ordered by a customer as quickly as possible, the vehicle is efficiently built within the shortest possible period of time by adhering to the following:

  1. When a vehicle order is received, a production instruction must be issued to the beginning of the vehicle production line as soon as possible.

  2. The assembly line must be stocked with required number of all needed parts so that any type of ordered vehicle can be assembled.

  3. The assembly line must replace the parts used by retrieving the same number of parts from the parts-producing process (the preceding process).

  4. The preceding process must be stocked with small numbers of all types of parts and produce only the numbers of parts that were retrieved by an operator from the next process.

http://www.toyota-global.com/company/vision_philosophy/toyota_production_system/
However, Toyota’s philosophy and approaches are much more complex than can be captured with such statements. They are culturally embedded and spread across the whole supply chain.

Spearman and Bowen’s research (1999) noted that much of what happens in Toyota is implicit to the operation of the organisation, may not be written down or cannot be explained when employees of the organisation are asked. This approach to working has been developing within the company for over 60 years and so is implicit in many aspects. The research also identified four ‘rules’ which capture some of the ways of working within Toyota i.e. the ‘DNA’ of the organisation.

The Four Rules

The tacit knowledge that underlies the Toyota Production System can be captured in four basic rules. These rules guide the design, operation, and improvement of every activity, connection, and pathway for every product and service. The rules are as follows:

Rule 1: All work shall be highly specified as to content, sequence, timing, and outcome.

Rule 2: Every customer supplier connection must be direct, and there must be an unambiguous yes-or-no way to send requests and receive responses.

Rule 3: The pathway for every product and service must be simple and direct.

Rule 4: Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the lowest possible level in the organization.

All the rules require that activities, connections, and flow paths have built-in tests to signal problems automatically. It is the continual response to problems that makes this seemingly rigid system so flexible and adaptable to changing circumstances. (Spearman, S. and Bowmen, H.K., 1999).

Toyota’s philosophy is based upon the removal of waste or ‘Muda’ from operations and is underpinned by a continual improvement philosophy and the techniques or Kaizen. In addition Heijunka (production ‘smoothing’), Poka-yoke (making tasks ‘fail-safe’) and Genchi Genbutsu (‘go and see for yourself’) are all included. Collectively these represent a complex blend of approaches and beliefs which shape the operations and behaviour of the organisation.

Many other organisations have adopted some of the techniques implemented by Toyota, such as the use of ‘Kanban’ cards and related pull-system approaches. However, the sustainability of competitive advantage lies within the implicit aspects of Toyota’s organisation knowledge and is driven by its organisational culture. This makes replicating Toyota operations very difficult for competitors.

Initially, many investigators of Japanese management techniques attributed the success of Toyota to links with the Japanese national culture. Ironically the early successes of Japanese manufacturing had been linked to the work of the ‘quality gurus’, such as W. Edwards Deming and Joseph M. Juran in the late 1940s and 1950s within the country. However, the world-wide network of Toyota production facilities indicates that these approaches have also been proven to be successful outside of Japan and its national culture.
Toyota underpins the philosophy, systems and functional elements within its company documentation, “The Toyota Way”. This philosophy is captured by the following fourteen points:

1. Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals.
2. Create a continuous process flow to bring problems to the surface.
3. Use “pull” systems to avoid overproduction.
4. Level out the workload (heijunka). (Work like the tortoise, not the hare).
5. Build a culture of stopping to fix problems, to get quality right the first time.
6. Standardized tasks and processes are the foundation for continuous improvement and employee empowerment.
7. Use visual control so no problems are hidden.
8. Use only reliable, thoroughly tested technology that serves your people and processes.
9. Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.
10. Develop exceptional people and teams who follow your company’s philosophy.
11. Respect your extended network of partners and suppliers by challenging them and helping them improve.
12. Go and see for yourself to thoroughly understand the situation (genchi genbutsu).
13. Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly (nemawashi).
14. Become a learning organization through relentless reflection (hansei) and continuous improvement (kaizen).

http://www.toyota-global.com/company/vision_philosophy/toyota_production_system

Toyota’s approach has many facets with philosophy intertwining with systems as well as tried and tested quality improvement methods. Whilst some of these are clearly recognisable, much appears to be derived from long-term in-company development.

**Global Supply Chain Operations**

The international development of Toyota has seen the creation of an impressive array of facilities throughout the world, making Toyota a true global player. Extensive information on company scale and reach is available from the company website and within the annual report. During 2012 Toyota had production or assembly plants in the following countries (Table 2):

<table>
<thead>
<tr>
<th>Japan</th>
<th>Australia</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sri Lanka</td>
<td>Canada</td>
<td>Indonesia</td>
</tr>
<tr>
<td>Poland</td>
<td>South Africa</td>
<td>Turkey</td>
</tr>
<tr>
<td>Colombia</td>
<td>United Kingdom</td>
<td>USA</td>
</tr>
<tr>
<td>France</td>
<td>Brazil</td>
<td>Portugal</td>
</tr>
<tr>
<td>Argentina</td>
<td>Czech Republic</td>
<td>Mexico</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Thailand</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Egypt</td>
<td>China</td>
<td>Vietnam</td>
</tr>
<tr>
<td>Venezuela</td>
<td>Philippines</td>
<td>Russia</td>
</tr>
</tbody>
</table>

**Table 2: Toyota Global Operations Locations**
Toyota Global’s figures for production, sales and Japanese export activities illustrate the changing nature of the business activity over a ten year period. These figures extracted from Toyota’s website clearly show changes in production, assembly and distribution operations. (Tables 3 – 5).

### Table 3: Toyota Production by region

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>1,278.4</td>
<td>1,444.0</td>
<td>1,535.1</td>
<td>1,519.3</td>
<td>1,636.9</td>
<td>1,404.8</td>
<td>1,189.1</td>
<td>1,404.0</td>
<td>1,206.1</td>
<td>1,720.6</td>
</tr>
<tr>
<td>Latin America</td>
<td>58.1</td>
<td>80.4</td>
<td>138.5</td>
<td>177.9</td>
<td>183.1</td>
<td>194.8</td>
<td>181.5</td>
<td>204.3</td>
<td>195.1</td>
<td>242.8</td>
</tr>
<tr>
<td>Europe</td>
<td>466.1</td>
<td>582.5</td>
<td>638.1</td>
<td>808.8</td>
<td>806.5</td>
<td>688.3</td>
<td>507.3</td>
<td>461.7</td>
<td>460.3</td>
<td>461.4</td>
</tr>
<tr>
<td>Africa</td>
<td>93.3</td>
<td>108.8</td>
<td>121.1</td>
<td>143.8</td>
<td>145.7</td>
<td>179.2</td>
<td>102.8</td>
<td>123.4</td>
<td>150.8</td>
<td>151.7</td>
</tr>
<tr>
<td>Asia</td>
<td>548.4</td>
<td>717.0</td>
<td>1,029.2</td>
<td>1,137.7</td>
<td>1,387.3</td>
<td>1,590.0</td>
<td>1,501.4</td>
<td>2,027.4</td>
<td>2,062.8</td>
<td>2,565.7</td>
</tr>
<tr>
<td>Oceania</td>
<td>113.6</td>
<td>109.9</td>
<td>109.2</td>
<td>111.6</td>
<td>148.9</td>
<td>141.4</td>
<td>96.8</td>
<td>119.4</td>
<td>93.7</td>
<td>101.4</td>
</tr>
<tr>
<td>Overseas total</td>
<td>2,558.0</td>
<td>3,042.7</td>
<td>3,571.2</td>
<td>3,899.0</td>
<td>4,308.6</td>
<td>4,198.4</td>
<td>3,579.0</td>
<td>4,340.4</td>
<td>4,168.8</td>
<td>5,243.6</td>
</tr>
<tr>
<td>Japan</td>
<td>3,520.3</td>
<td>3,680.9</td>
<td>3,789.6</td>
<td>4,308.6</td>
<td>4,198.4</td>
<td>3,579.0</td>
<td>4,340.4</td>
<td>4,168.8</td>
<td>5,243.6</td>
<td>5,243.6</td>
</tr>
<tr>
<td>Worldwide total</td>
<td>6,078.3</td>
<td>6,723.7</td>
<td>7,360.9</td>
<td>8,093.2</td>
<td>8,534.7</td>
<td>8,210.5</td>
<td>6,371.3</td>
<td>7,623.3</td>
<td>6,928.8</td>
<td>8,736.5</td>
</tr>
</tbody>
</table>

(1 unit = 1,000 vehicles)

### Table 4: Toyota Sales by Region

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>782.8</td>
<td>813.5</td>
<td>939.6</td>
<td>1,344.7</td>
<td>1,244.1</td>
<td>1,244.1</td>
<td>1,124.2</td>
<td>574.0</td>
<td>628.2</td>
<td>494.7</td>
</tr>
<tr>
<td>Latin America</td>
<td>71.5</td>
<td>95.6</td>
<td>120.2</td>
<td>148.9</td>
<td>178.9</td>
<td>146.4</td>
<td>61.3</td>
<td>106.9</td>
<td>95.6</td>
<td>116.4</td>
</tr>
<tr>
<td>Europe</td>
<td>424.6</td>
<td>419.0</td>
<td>360.7</td>
<td>375.1</td>
<td>441.5</td>
<td>420.3</td>
<td>230.4</td>
<td>293.7</td>
<td>343.0</td>
<td>311.9</td>
</tr>
<tr>
<td>Africa</td>
<td>58.2</td>
<td>92.0</td>
<td>107.2</td>
<td>130.0</td>
<td>147.0</td>
<td>148.7</td>
<td>67.5</td>
<td>72.4</td>
<td>54.7</td>
<td>64.9</td>
</tr>
<tr>
<td>Asia</td>
<td>154.7</td>
<td>156.2</td>
<td>129.8</td>
<td>112.3</td>
<td>151.2</td>
<td>169.1</td>
<td>127.1</td>
<td>184.0</td>
<td>183.0</td>
<td>205.4</td>
</tr>
<tr>
<td>Oceania</td>
<td>154.1</td>
<td>164.6</td>
<td>159.2</td>
<td>171.6</td>
<td>175.2</td>
<td>184.2</td>
<td>144.4</td>
<td>165.8</td>
<td>146.3</td>
<td>174.3</td>
</tr>
<tr>
<td>Middle East</td>
<td>182.6</td>
<td>202.1</td>
<td>226.5</td>
<td>246.7</td>
<td>328.3</td>
<td>393.4</td>
<td>240.0</td>
<td>288.6</td>
<td>247.7</td>
<td>363.6</td>
</tr>
<tr>
<td>Total</td>
<td>1,836.0</td>
<td>1,951.7</td>
<td>2,043.2</td>
<td>2,529.3</td>
<td>2,666.1</td>
<td>2,586.3</td>
<td>1,444.7</td>
<td>1,745.0</td>
<td>1,568.9</td>
<td>1,945.7</td>
</tr>
</tbody>
</table>

(1 unit = 1,000 vehicles)

### Table 5: Toyota Exports from Japan

http://www.toyota-global.com/company/profile/figures/vehicle_production_sales_and_exports_by_region.htm
Toyota’s Annual Report of 2012 identified a number of intentions for changing the nature of its supply chain operations. These included:

- A greater focus upon emerging market activity, with both production and sales
- Closer alignment of design, development and production for improved customer-product focus
- Enhanced development capacity to support product and process innovation
- Increased parts standardisation
- Enhancements to automation and just-in-time initiatives
- Increased flexibility of production capacity to meet demand
- Producing cars ‘attuned to regional needs’
- More rapid disaster recovery.

Clearly, the achievement of these objectives should lead to ongoing business for Toyota, within a highly competitive market where all players are trying to be leaner and more agile.

**Challenging Events**

When Toyota topped the global vehicle production charts in the first quarter of 2008 it seemed that it was destined to continue its rise. The expectation was that it would consolidate its position as global number one, particularly in light of the ongoing restructuring challenges facing General Motors. However, the following three years proved challenging because of the global financial crisis and the product recalls Toyota faced.

**Product Recalls**

As noted previously in the case, in late 2009 there were problems in the North American market when Toyota vehicles were reported to be experiencing ‘unexpected acceleration’. Toyota responded to early reports, which had been attributed to incorrectly fitted floor mats, by encouraging owners to remove the mats and also by recalling over four million vehicles. However, the fault continued to be reported throughout the year. By February 2010 over eight million vehicles had been recalled. The cause was eventually identified as an accelerator pedal fault. Toyota eventually ceased production and sales of the affected models, including the flagship hybrid the Prius. Its previously strong reputation for quality had been severely dented and customers, the USA government, and the press were asking why this fault was taking so long to identify and rectify. [www.CNN.com](http://www.CNN.com)

Throughout this incident there was a perceived lack of visibility of Toyota’s top management. This contributed to the negative publicity generated. The approach to corporate communication was indicated as a cultural issue by some of the North American press. It was suggested that Toyota managers would not communicate and apologise until a solution had been identified, in keeping with Japanese norms. North Americans, in contrast, generally expect rapid problem recognition as well as a visible action plan to show progress.

Although vehicles in Europe and China were also deemed faulty, less publicity was evident in these markets. American authorities fined Toyota $16.4 million for failing to rectify the fault within the required period. This rose by to almost $50 million in fines once the problems had finally been resolved.

Overall, the fines and costs could be considered inconsequential for Toyota in comparison to the reputational damage if suffered from the incident. American congressional hearings were initiated to consider whether brake over-ride technology should be fitted to vehicles to prevent recurrence of similar events.

However, Toyota’s recall concerns were not over. In late 2012 a product recall was issued to 7.4 million vehicles worldwide for a window switch fault. The switches had been reported as melting. Some national authorities interpreted this as a fire risk. The use of certain cleaning products was thought to exacerbate the problem. Toyota was swifter with communications on this occasion in both North American and European markets. Whilst recalls are not uncommon within the industry, the scale of the Toyota recall was unprecedented. The next largest incident had been in 1996 for the Ford Motor Company.
Natural Disasters

Toyota (Annual Company Report, 2012) reported that the great East Japan earthquake of March 2011 caused massive disruption to suppliers based within the Tohoku region and adjacent areas. Domestic vehicle production stopped and it is estimated that production of over 750,000 vehicles was lost.

In July 2011 floods in Thailand had a similarly disruptive impact on Toyota’s suppliers and caused an estimated production loss of approximately 250,000 vehicles.

These two events cumulatively amounted to approximately one million vehicles lost from production, but Toyota reported that by sourcing and switching activities across elements of its global supply chain, it was able to recover production of approximately 600,000 vehicles. The events provided an important lesson for Toyota and its further intent showed a commitment to managing such supply chain risks more effectively in future (Canis, 2011, Leckcivilize, 2012).
References


OECD (2011), Recent Developments in the Automobile Industry, OECD Economics Department Policy Notes, No.7


Toyota Annual Company Report http://www.toyota-global.com/, accessed 26th June 2013


