

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/296177738>

"I'll be back": a deep analysis on mass product recalls of non-food products

Conference Paper · February 2016

CITATIONS

0

READS

133

3 authors, including:



Monique van Kempen

University of Twente

1 PUBLICATION 0 CITATIONS

SEE PROFILE



Alberto Martinetti

University of Twente

16 PUBLICATIONS 10 CITATIONS

SEE PROFILE

“I’ll be back”: a deep analysis on mass product recalls of non-food products

Monique M.J.C. van Kempen ¹, Alberto Martinetti ², Leo A.M. van Dongen ³

¹ Dept of Design, Production and Management, University of Twente, Enschede
Drienerlolaan 5, 7522 NB, The Netherlands, m.j.c.vankempen@utwente.nl

² Dept of Design, Production and Management, University of Twente, Enschede
Drienerlolaan 5, 7522 NB, The Netherlands, a.martinetti@utwente.nl

³ Dept of Design, Production and Management, University of Twente, Enschede
Drienerlolaan 5, 7522 NB, The Netherlands, l.a.m.vandongen@utwente.nl
Fleet Services, NedTrain, Utrecht, Stationshal 17, 3511 CE, The Netherlands

Abstract

The increasing speed and complexity with which products are designed and produced, seems to make technical, legislative, safety related or ethic failure of the products unavoidable; this leads to an increasing amount of product recalls worldwide. Despite the worldwide market these product recalls are not globally dealt with as the involved legislation and organizations are often regionally oriented.

The paper identifies broadly recognised answers on what a product recall is, what causes product recalls, how to execute them and how to reduce their likelihood. Based on an extensive literature study, three case studies from global companies are analysed: lead infected toy recalls (2007), unexpectedly accelerating cars recalls (from 2009 to 2013) and legislative diesel emission recalls (2015).

According to the collected data and to the analysis carried out, it appears that the globalization of industry and markets lead to new challenges that are not always acknowledged by the companies facing them. Some definitions from the past need to be reformulated in order to maintain their usability, on the other hand new fields of expertise are arising, such as the communication by social media that a company has to handle in case of a product recall. Describing the current state of knowledge, the study shows further research opportunities to better understand product recalls and provides some interesting solutions to manage them.

Keywords: product recall, root causes, product recall communication, recall strategies

1. What is a product recall?

During a product recall, products are taken back into the supply chain. This process is explained by Schuurman using the terms ‘upstream’ and ‘downstream’ stakeholders (1997). Simply stated, all suppliers are upstream stakeholders and all customers are downstream stakeholder (Figure 1). Therefore, normally, the flow products undergo is downstream, e.g., from supplier to producer, distributor and consumer. In a product recall however, products return to the upstream stakeholders.

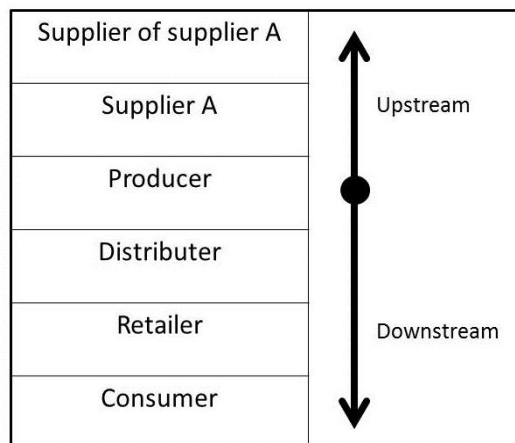


Figure 1. Upstream and downstream product flow.

1.1 Different definitions for different geographical regions

Although a product recall is always an upstream product flow, the definitions that are used in a product recall differ per (inter)national regulatory authority. Besides ‘product recall’ also ‘product withdrawal’ is often used, with a different meaning depending on the regulatory authority. In the European Union and the United States, one batch of products can at the same time be recalled and withdrawn, where a recall applies to product that reached their final customers and a withdrawal applies on product that did not reach their final customer (Consumer Rights Protection Centre unknown, The Gilbert Law Group 2015). In Australia, the difference between a product recall and a product withdrawal lies in the danger of the faulty product. Due to the this reason, recalls in Australia are always compulsory, while product withdrawals are always voluntary (Dingley 2013).

In the European Union, all public recall and withdrawal events are stored in the European Alert System RAPEX to exchange product health and safety issues within member states of the European Union (European Commission 2015). In the United States, two databases exist: the database of the Consumer Product Safety Commission (CPSC.gov) and the database of the National Highway Traffic Safety Administration (safecar.gov). Australia records its recalls at recalls.gov.au.

1.2 How to describe a product recall in parameters

Although product recalls occur ever since products are made and delivered to customers with mass production (McGuire 1974), no guidelines exist to evaluate a recall campaign. Due to the difference in regulation and monitoring of recalls on various geographical locations, literature offers only few parameters, which are developed in relation to the definition and the monitoring system of product recalls.

The completion rate, for example, is defined as “the percentage of currently used products that is recovered in a product recall”. It is used to give an indication of the success of a product recall, as it describes the number of products returned from customers during the recall. The completion rate is formulated by Berman (1999), but could be more useful when the formulation ‘currently used products’ is exchanged for ‘distributed products’. This phrasing is already used by the organization ‘Kids in danger’ and shows some interesting numbers in the United States’ toy market, as can be seen in Table 1. From the report appears that although consumers are in general far more unreliable during product recalls than more upstream stakeholders, not always all products from the intermediate stakeholders return to the collecting upstream stakeholders (Durett 2015).

Downstream stakeholder	Percentage of children’s products corrected or destroyed
Distributor	93.51%
Retailers	89.78%
Manufacturers	79.66%
Consumers	3.96%

Table 1. The completion rate per stakeholder of children’s products that were recalled in the United States in 2013 (Durett 2015)

The parameter ‘time to recall’ has large influence on the efficiency of a product recall, but can be described in two ways. In North-American literature, this time is ‘the time from first product sale to the announcement of recall’ (Hora et al. 2011), where European literature uses ‘the time taken to start the recall after primary signals of potential injuries arise’ (Magno 2012). The difference originates in the information available in product recall databases. Besides formulating a ‘time to recall’ parameter, Hora also shows variables influencing this parameter, such as the recall strategy, country the product is made in and kind of product defect.

Lastly, Hsu and Lawrence (2014) propose to use a stock exchange parameter to measure the effect of a recall on a company. This parameter is already used to measure the effect of marketing actions and other short-term events because stockholders react quickly and the stock exchange can be quantified. Yet, Srinivasan and Hanssens recognize that shareholders may “wrongly evaluate the impact of a market driver on future cash flows” and the stock exchange is the result of a whole company, instead of one action with one product (2009). However, as the loss of shareholder value is often the largest part of the complete costs of the recall, the stock exchange is considered to be a useful parameter to measure the financial consequences of a product recall on a company.

2. Why “I will be back”: root causes

The reasons why product recalls are undertaken can differ greatly, but in most cases the product suffered from a lack of safety due to a design flaw, manufacturing defect or inadequate instructions, labelling or warnings. Of those causes, manufacturing defects and design flaws lead to most recalls (Hora et al. 2011).

As underlined by Berman (1999) and Hora (2011) also a lack of effectiveness and a lack of durability can cause product recalls. Examples hereof are when a company decides to recall products in which the advertised performance standard is not met, or of which the paint fades prematurely. Furthermore, customer relations can be the trigger to recall a product as in some occasions, firms use a recall to demonstrate to customers the company’s commitment to quality (Berman 1999, Schuurman 1997). However, opportunistically exploiting a recall to increase sales produces negative effects on the company-consumer relationship. Still, consumers do appreciate recalls of unsafe products that were spontaneously and voluntarily decided upon by the company (Magno 2012).

Besides the mentioned reasons for recalls also recalls based on patent infringement, forbidden materials (e.g., substances abstracted from endangered animal and plant species) and cultural differences (e.g., the understanding of the product’s name) occur. As those triggers for product recalls are not mentioned in the literature that was consulted, it is assumed that they do not occur very often.

2.1 Liability in product recalls: a comparison between European Union and US

The common factor in all reasons for product recalls is that the product recall is executed to prevent liability. In the European Union, the principle of ‘liability without fault’ applies: The producer/importer is responsible for any defective product, even when damage caused by the defect is not the fault or negligence of the producer/importer (The council of the European communities 1985). The producer/importer is only not at fault when can proved that he:

1. did not put the product into circulation with its defect;
2. the product was not manufactured to be sold or distributed for profit;
3. the defect is unavoidable due to mandatory regulations issued by the authorities;
4. at the time the product was brought into circulation the defect could not be discovered.

In the United States, different kinds of liability are used for different situations. ‘Strict liability’ herein, means the same as the European term ‘liable without fault’. Under this liability, a company can only be sued for the safety reasons. Besides ‘strict liability’ companies can also be sued for other reasons, dependent on the state they are registered in.

Similar to the European system, in the United States joint liability exists if more than one party is at fault. Other than in European legislation however, only the wrongdoer is to pay. With ‘indemnification’, stakeholders can make upstream stakeholders pay for any damage the defective product has caused. Still, most costs due to liability are made during the trial. Because of the high costs, about 96% of the product liability cases ends in a settlement (Mayer et al. 2011).

2.2 Considerations leading to a product recall

In the decision whether or not to have a product recall the company should reflect on three questions (Schuurman 1997):

1. Is our way of working ethical concerning the prevention of human injury?
2. Does our way of working comply with the applicable regulations and other commitments we took?
3. Can we be proud of our decisions?

Nonetheless, besides the cause of the potential recall, the financial aspect of a product recall plays a large role in deciding whether or not to perform this action. This is especially the case in recalls due to safety issues, as compensations for human injuries and deaths are very costly (Hora et al. 2011).

The costs of a product recall can be divided in direct and indirect costs, as shown in Table 2. The direct costs are affected by the number of products sold, the products price, its labour and manufacturing costs, geographical distribution and the estimated recall's completion rate (Berman 1999). The highest loss due to indirect costs is probably the loss of company value, which is caused by the recall in many ways. This customer's perception of the product recall is widely recognized as one of the reasons for indirect loss and mostly influenced by the management of the product recall, e.g., whether the company blames others for mistakes and approaches the recall in a responsible or opportunistic manner (Magno 2012).

Direct costs	Cause
Recalling the product:	Managing the reverse flow of products (including communication with different parties), disposing these products and replacing or repairing defective products (Berman 1999, Hora et al. 2011)
Direct harm done by the defective product:	Legal and liability costs due to any litigation, societal costs (McGuire 1974, Hora et al. 2011)
Direct loss of profit:	No products that are recalled are sold (Berman 1999)
Indirect costs	Cause
Loss of company value:	Brand image is affected (Berman 1999, McGuire 1974, Hora et al. 2011) Erosion of market value (Hora et al. 2011) Blame attributed to the company leading to negative word of mouth (Berman 1999, Magno 2012) Lowered stock market price (Berman 1999)
Loss of sales:	Future sales of the recalled product, profit from related products (Berman 1999)
More legislation:	Publicized accounts of product failures and recalls (McGuire 1974)

Table 2. Costs of product recalls

Finally, also the expected effectiveness of the recall operation plays a role in the decision to make a product recall. In the Toyota recalls, for example, improper repairs were found when owners kept complaining about accelerator pedal issues (Unknown 2015). If the risk that a repair will not succeed is too large and reimbursing and discarding the product is not an option as well, the recall will not be executed.

3. How is the product recall executed?

In a product recall, three different phases can be distinguished: the discovery of the defective product, the upstream flow of the product and the destruction or repair of the product. They are consequently discussed.

The discovery of a product defect is in most cases made by the company, a regulating authority or a consumer and, in cases of patent infringement, by a competitor company. At the moment of discovery, a specialized recall team should already be appointed in the company to institute a safety planning and develop effective communication channels (Berman 1999). Additionally, tracked data should be made available to enable the company's management to make a decision about whether or not a recall is in place (Wynn et al. 2011).

When the decision is made to perform a product recall, the downstream stakeholders should be informed. The closer the product has come to its consumers in its distribution chain, the more parties should be informed. Dependent on the kind of product and the information on the company's customers, a consumer specific or a general recall message should be released.

Next to the release of the information on the defective products, logistic measures should be taken to enable the product to return to its upstream suppliers or to be repaired at the consumer's home. In the meanwhile, the production of new defective products should be prevented (McGuire 1974, Hutchinson 1974).

As last step during the execution of the recall, the defect in the product should be taken of the market. This can be done by repairing the defect, destroying the product or storing it in a safe place. Not seldom, a number of defective products is stored for further reference within the company and to enable particular investigation during liability suits (McGuire 1974).

3.1 Product recall strategies

In general, the execution of a recall mostly lies in the hands of companies.

Generally speaking, there are two main strategies in which companies may cope with product recalls: the preventive recall strategy and the reactive recall strategy (Table 3). Both strategies have their own (dis)advantages, which do not make it easy for companies to determine which to choose. Although performing a preventive recall might on the one side portray the firm in a positive light, the same recall might also send a signal of upcoming negative consequences to the company's shareholders. Therewith, in a preventive recall products take longer time to recall than in a reactive recall strategy (Hora et al. 2011).

Preventive recall strategy	Reactive recall strategy
Execute quality checks & inspections to discover potential safety hazards & product defect a priori	Not proactively scout product defects that might cause a safety hazard
Do a voluntary recall before injury is reported	Initiate recall investigation process after injury is reported
Take longer to issue a recall	Less time needed to recall

Table 3. The characteristics of a preventive and a reactive recall strategy (Hora et al. 2011)

Regardless of the strategy a company uses for its product recalls, the data that are needed for recalls should be present. Examples of these data are the suppliers that contributed to the product, the different steps a product goes through during production and assembly and the people working on this product during these processes. Wynn et al. argue that these data can be retrieved by tracking or by tracing. The difference between those two lies in the moment on which data are stored; on beforehand or when the data are needed. As in some geographical regions, companies are obliged to track certain data, also a combination of tracking and tracing might be used (European Commission 2014). Yet, especially in the car industry and other

product markets with large numbers of suppliers, e.g., the toy industry, almost solely tracking is used.

Although companies can use their tracked product information in more ways than to identify why and which products should be recalled, whether companies use tracking of tracing does not imply the use of a preventive or reactive recall strategy. Still, in order to discover potential non-functioning products, a company with a preventive recall strategy might decide to use tracking to keep an eye on the product during its use phase.

4. The lesson learnt: lead toys, unexpectedly accelerations and diesel emissions

In the last decade, three product recall campaigns are relevant to be used as study cases for product recalls. Figures 2 and 4 show the Mattel and Toyota recalls by means of a timeline in which the most important events are listed. Standing out on these timelines is that both recalls are actually a range of recall events, as in case of the Mattel recall, the origin of the defective products was not known, while at the Toyota recalls the problem could not be identified. The Volkswagen case is alike the Mattel and Toyota recalls a sequence of events, but no timeline is shown here as the recall process is still ongoing: it could not be determined which events are most important for the further course of this recall sequence.

4.1 Product recall for lead infected toys

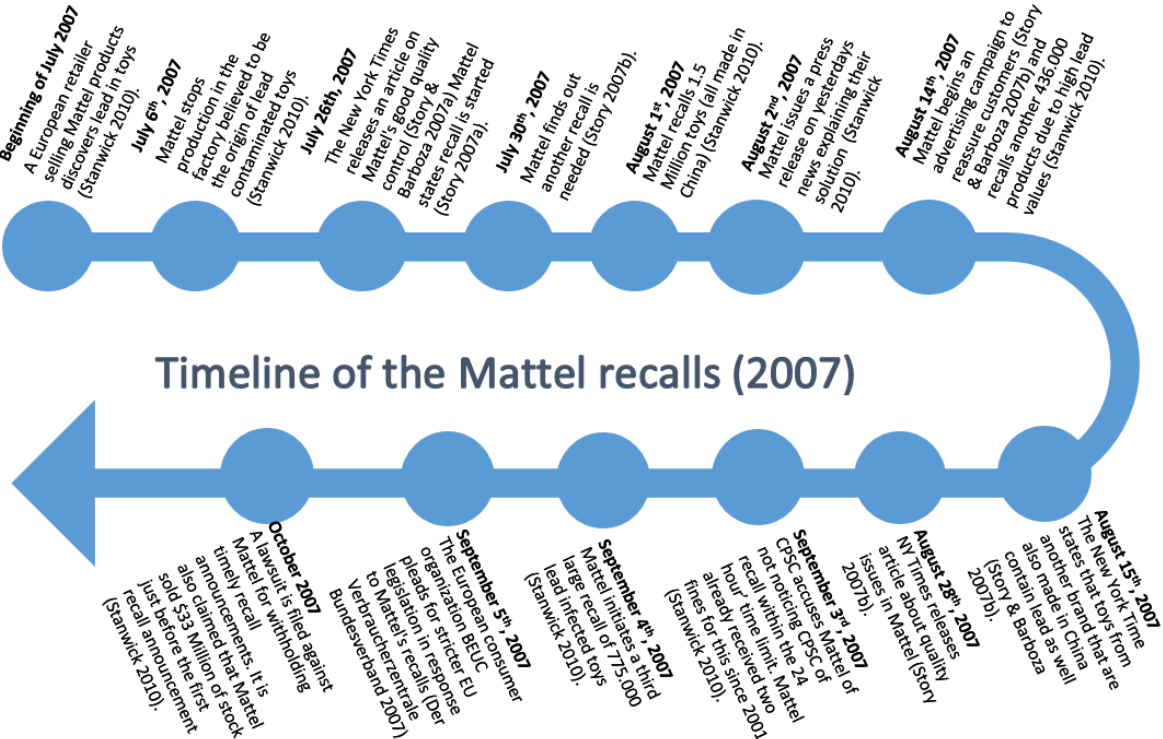


Figure 2. The timeline of the Mattel recalls

In 2007, Mattel had to recall millions of toys that exceeded lead safety values. This problem was not only Mattel's as many actors in the toy market suffered from recalls due to lead infected toys in this year; the number of recalls can be found in Figure 3. However, Mattel had a very peculiar way to handle the recall. When at the beginning of July 2007, the need for a recall became clear and the first factory was closed, Mattel invited the New York Times to investigate Mattel's quality control. Only after the day that an article is published that states Mattel has good quality control, it becomes known that Mattel is planning a product recall (Stanwick & Stanwick 2010, Story 2007a). From that point of however, the reporter who wrote the piece

about quality control firmly keeps her eyes on the Mattel recall, leading to many more articles about Mattel's recall. Therewith, Mattel achieved the exact opposite of what the company wanted to happen.

Besides the New York Times article about good quality control, Mattel seemed to have taken financial measures before announcing the product recall. Furthermore, as a number of recalls was executed, the traceability of Mattel's products did not seem to be well arranged (Stanwick & Stanwick 2010, Story 2007b). According to Wynn, the manufacturing system should at least keep track of the product numbers, model numbers, production dates and manufacturers involved when many products are produced by a variety of manufacturers overseas (2011).

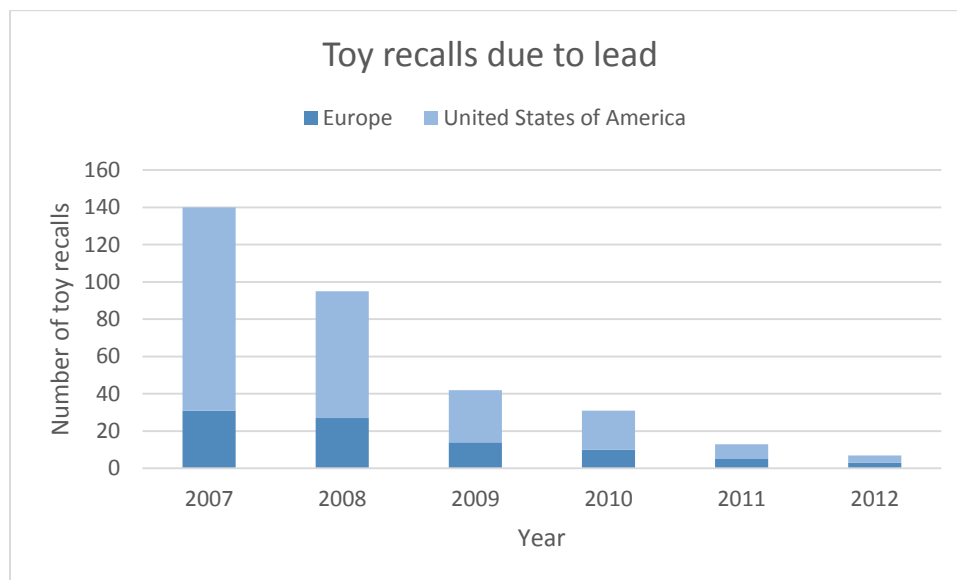


Figure 3. The number of children's product recalled due to lead in Europe and the United States (The Rapid Alert System for Non-Food Products (RAPEX) 2007, Durett 2015)

4.2 Product recall for unexpectedly accelerating cars

Toyota did not try to influence the media in a uncommon way, but did receive negative media attention as well: After Toyota's message on the 26th of January 2010, sixty per cent of the online chatter about Toyota was associated with the words 'recall', 'pedal', and 'fix'. The influence of this negative word of mouth was directly notable in the plunge in share price (Hsu & Lawrence 2014).

However other than in the case with Mattel, the loss of brand value of Toyota was mainly caused be the inability to discover the defect that led to the recalls. First, Toyota spread the message that the accelerator pedal could get stuck because of the floor mats (National Highway Traffic Safety Administration unknown). Secondly, the problem was addressed to mechanical sticking (Johnson 2009). After this, for extra prevention, a software braking system called 'Hybrid anti-lock-brake software' was being installed. However, also cars that had the repairs and did not have floor mats suffered from unintended acceleration.

When comparing the theory with practice of the Toyota case, large differences are revealed. In case a company does not know what the problem is of a defective product, it can decide to recall the product, but does not have the knowledge to appoint the products that are defective and cannot show what should be done with the defective products. In case of the 6,5 Million cars that were recalled by Toyota in total, it would too very expensive to take them all back and reimburse the customers. Many researchers investigated this Toyota case in descriptive studies, but it seems that no solutions are thought of at the moment to recall an expensive product without reimbursement if the cause of the defect is unknown.

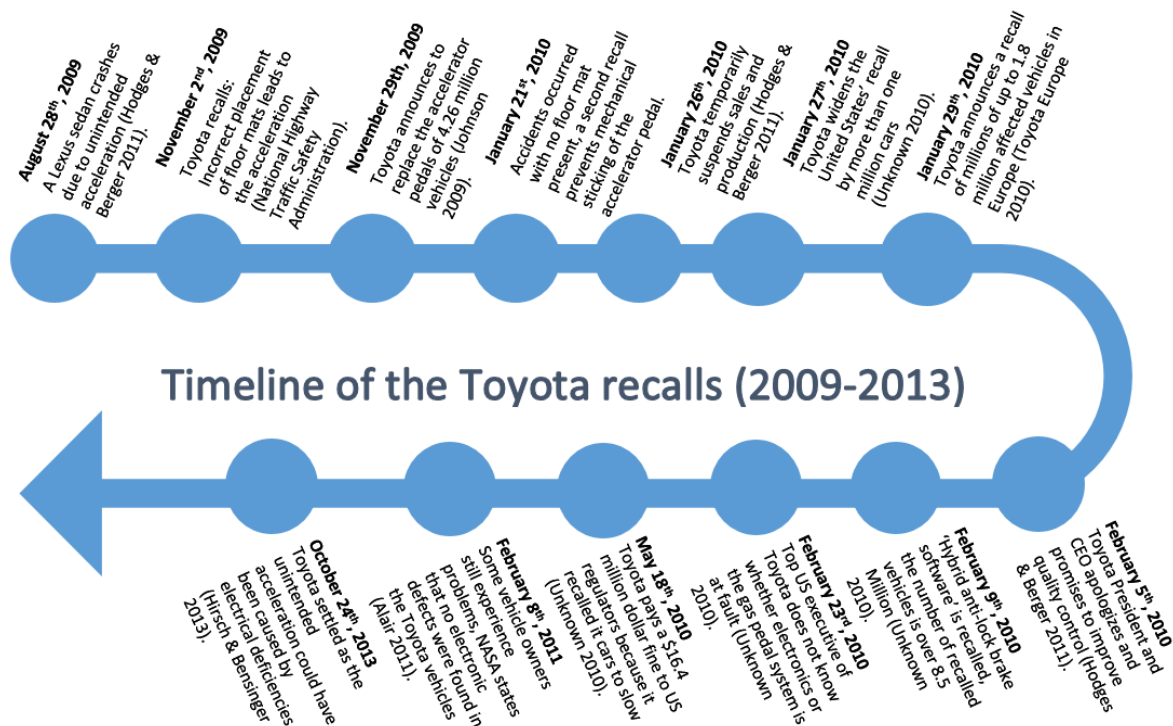


Figure 4. The timeline of the Toyota recalls

4.3 Product recall for diesel emission

In September 2015, Volkswagen A.G. admitted to circumvent the emission legislation of diesel car engines for better overall engine performance. At the moment of writing it is expected that about 11 million vehicles will be recalled worldwide (Barlett 2015). As the non-compliance of the regulation originates from the software that is used, it is likely that in most cases the recall will consist of a software update.

For now, it does not seem that the consumers' appreciation of the affected Volkswagen brands diminishes due to the diesel emission recalls. Two-third of the consumers say to have trust in Volkswagen and expect the circumvention to be forgotten within a year (Kollewe 2015). A larger danger for the company now lies in the financial resources of the company and the investor's trust in the company's recovery. During the Monday stock opening after the recall announcements (on Friday), within minutes Volkswagen lost €15 billion of its share price. Therefore, the communication financial connections of the company is at utmost importance right now. Most difficult herein is expected to be the wide distribution of Volkswagen's products and the difference in actions taken by the authorities of those regions.

The first statement of the CEO of Volkswagen was admittance of circumvention of the emission regulation. In this announcement the CEO also expressed his regrets. Three days later, he said he was personally not at fault and left the company. A statement from the person replacing him was better received. Already two and a half weeks after the first accusation, the United States' recalls were planned.

Yet, besides the United States, also other countries demand measures: Switzerland banned sales of Volkswagen cars, the United Kingdom demands compensation to its affected inhabitants and several countries are exploring their options to get back subsidies that were offered based on the claimed limited emissions (Kollewe 2015). The extent to which this will affect Volkswagen will largely depend on the financial resources they can find to cope with the diesel emission recalls.

5. How can the product recall be prevented, improved and managed?

In 1974, Schmidt already wrote "... clearly recalls should be minimized." (1974) However, Berman stated in 1998 that the number of recalls is growing and "... it is probably only a matter of time for any product manufacturer to have one or more of its products recalled.". According to him, the number of recalls is rising as the number of parts, processes, suppliers, types of consumers and product uses rises. Concordantly, solutions should not only be found in the prevention of product defects, but companies should also prepare themselves for this 'inevitable product recall'. Here, both tactics will be investigated. First, the ways in which the chance of a product recall can be minimized will be discussed, following by a description of ways to improve the 'inevitable product recall'.

5.1 Preventing product recalls

In general, product recalls can be prevented by not offering defective products to downstream suppliers. This can be achieved by not producing defective products or removing defective products before they are handed over to a downstream supplier. In both cases, preventing a product recall is a matter of quality control. However, as it is impossible (or at least very costly) to have quality control that gives a hundred per cent guarantee, companies are advised to implement preventive measures on both sides of the medal.

In order to prevent that defective products are being produced, Six Sigma and Lean manufacturing can be used in the production process. Of these methods, Lean manufacturing is not designed to prevent product recalls, but it is acknowledged that the effectiveness of manufacturing practices significantly influences the production performance. Therewithal, in the design process Lean product development and Failure Mode and Effect Analysis (FMEA) are advised (Kumar and Schmitz 2011).

However, as many defects are not noticed until the product is used by its consumers, 'in-home' testing can prevent product recalls. Questions that can be answered with this analysis are for example 'Who is using the product?', 'What are the conditions in which the product is used?' and 'Has the consumer modified the product?' (Berman 1999).

A formal safety inspection process that is used within the food industry, but also applicable to physical products, is Hazard Analysis Critical Control Points (HACCP). This inspection method can both be used to prevent the manufacturing and distribution of defective products (Berman 1999). Lastly, the distribution of defective products can be minimized by testing whether the requirements of the product are fulfilled in several stages during the production process.

5.2 Improving and managing the product recall communication by social media

Although the available literature does not give an answer to the question what a perfect or even efficient product recall is, many ways are described to create a better product recall. The most mentioned aid is the availability of a product recall plan or protocol. Magno stresses the importance of this plan or protocol as such preparation gives the company more freedom to perform a product recall without interference of regulating authorities. In this case, the preparation should be the result of a cooperation of many different disciplines, which also play a role when the recall is executed (2012).

Schuurmans, on the other hand, dedicates a full chapter to the description of an 'emergency' plan. With help of questions such as 'Which facts and opinions should be collected before a decision can be taken?' and optional answers to these questions, the reader is given clear and detailed instructions (1997). However, a detailed and elaborated action plan as indicated by Schuurman can also be dangerous. The company might approach the recall's execution as a fixed way of working and will not anticipate on the effect of the recall on its customers, although this can make a huge difference during a product recall. Furthermore, many changes occur in the way of communicating as social media become an increasingly important way to contact

consumers. This requires a recall plan or protocol to be updated continuously, which is hard to do with large, detailed documents (Hsu & Lawrence 2014).

Berman proposes another idea that might be more suitable to this current, fast changing era; to hire or choose someone within the company that dedicates a substantial portion of his/her time to plan a product recall. This person should also be involved in quality control, as it might be possible to prevent a recall in an early stage, and in customer contact, as customer complaints can indicate products should be recalled (1999).

Besides preparing the way of working before a recall, a recall can also be improved during its execution. One of the most important and most difficult to achieve characteristics is responding quickly to the first signals of product defect. With a prompt reaction the negative effects for the company can be reduced, even more if the reaction that is formulated expresses engagement towards any consumer that might suffer from the product (Magno 2012). 'Page principles' such as "listen to the customer" and "tell the truth" can help to formulate this reaction (Hodges & Berger 2011).

Lastly, it is proposed to thoroughly evaluate a recall when it has taken place and adjust or add quality control measures where necessary as Kalaignanam has demonstrated that car manufacturers that do so have significantly less recalls in the future than car manufacturers that do not. Therewith, the safety of products of companies that suffered from a recall before improved as less injuries were reported in following product recalls (2013).

6. Conclusions and further research

In this paper, the diversity of the definition, the reason, the execution and prevention of product recalls were investigated. It was stated that this diversity is dependent on the way a product is looked at, the geographical region the product recall occurs in, the product's characteristics and its extent of distribution. Besides this complexity, the parameters that are used in the research of product recalls vary, such that it is hard to perform comparative studies. Therewith, only little data are available from the viewpoint of companies, as companies think the best product recall is that recall that is forgotten the fastest. Therefore, also only recalls of products that reached their final customers could be investigated in this paper.

The common factor of product recalls is that all product recalls are an upstream flow of a product in which the product comes into contact with multiple stakeholders. The recall itself is most often initiated by the company, giving it the name of a voluntary recall (Arnold & Itkin LLP 2015, The Rapid Alert System for Non-Food Products (RAPEX) 2007). When the decision to order a recall is made, the safety of the consumer, estimated costs of the recall and the expected outcome is discussed. Furthermore, it is important that the company decides how they want to communicate the recall and to which extent they want to try to steer the media's responds to the recall (Hsu & Lawrence 2014). This field is rapidly changing and not much research is done yet to the role of social media herein.

However, already long before the need for a recall was identified, a company should prepare itself (Hutchinson 1974). This can be done by writing a detailed recall plan or procedure or by appointing someone in the company who should continuously work on recall preparations (Berman 1999, Schuurman 1997). Besides this activity, a way of working should be introduced that enables the company to quickly retrieve data on any defective products (Wynn et al. 2011). Therewith, just like a product recall, the preparation of a product recall is a multidisciplinary activity that involves many stakeholders (Berman 1999, Wynn et al. 2011).

At the end of a product recall, the recall should be evaluated. Although it is inevitable that a product recall takes place, many recalls can be prevented by this evaluation. Additionally, recalls that do have to be executed might be improved. Kalaignanam et al. recognize that a recall is a harmful event for a company, but also see its positive effects: if this evaluation is performed properly, the chances of another recall are lowered and the amount of incidents that happen with a defective product will diminish as well (2013).

Besides companies, also legislators can benefit from further research into this topic. When it is known which factors influence product recall parameters, governments can take action to limit the bad influences. An example hereof is the CPSC's rule that the government should be informed within 24 hours. If it is found that this rule improves the time to recall, it might also be beneficial to use it in other countries.

7. References

- Alair, O., 2011. U.S. Department of Transportation Releases Results from NHTSA-NASA Study of Unintended Acceleration in Toyota Vehicles. Retrieved from <http://www.nhtsa.gov/PR/DOT-16-11>.
- Arnold & Itkin LLP, 2015. What does a voluntary recall mean? Retrieved from <http://www.arnolditkin.com/Personal-Injury-Blog/2015/July/What-Does-a-Voluntary-Recall-Mean-.aspx>.
- Barlett, J. S., 2015. Guide to the Volkswagen Emissions Recall. Retrieved from <http://www.consumerreports.org/cro/cars/guide-to-the-volkswagen-dieselgate-emissions-recall->.
- Berman, B., 1999. Planning for the inevitable product recall. *Business Horizons*, March/April 1999, 69-79.
- Consumer Rights Protection Centre, unknown. *How to organise product withdrawals and recalls*. Retrieved from http://www.ptac.gov.lv/sites/default/files/docs/lg_5_-_product_withdrawals_and_recalls.pdf.
- Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products, 1985.
- Der Verbraucherzentrale Bundesverband, 2007 October 5th. BEUC statement on latest Mattel recall Retrieved from <http://www.vzbv.de/dokument/beuc-statement-latest-mattel-recall>.
- Dingley, M., 2013. Product recall or withdrawal? 7 facts every manufacturer should know. Retrieved from <http://blog.matthews.com.au/index.php/product-recall-withdrawal-7-facts-every-manufacturer-know/>.
- Durett, J., 2015. *A Decade of Data: An In-depth Look at 2014 and a Ten-Year Retrospective on Children's Product Recalls*. Retrieved from Chicago USA.
- European Commission, 2014. *The 'B;ue Guide' on the implementation of EU product rules*. (20140401).
- European Commission, 2015. Rapid Alert System for dangerous non-food products. Retrieved from http://ec.europa.eu/consumers/consumers_safety/safety_products/rapex/index_en.htm.
- Hirsch, J., & Bensinger, K., 2013. Toyota settles acceleration lawsuit after \$3-million verdict. *Los Angeles Times*. Retrieved from <http://articles.latimes.com/2013/oct/25/autos/la-fi-hy-toyota-damages-20131026>.
- Hodges, W. & Berger (Producer), B. K., 2011. Accelerating into Trouble: An Analysis of Toyota Motors. Retrieved from <http://www.awpagesociety.com/insights/winning-case-studies/2011/>.
- Hora, M., Bapuji, H., & Roth, A. V., 2011. Safety hazard and time to recall: The role of recall strategy, product defect type and supply chain player in the U.S. toy industry. *Journal of Operations Management*, 29, 766-778.
- Hsu, L., & Lawrence, B., 2014. The Role of Social Media and Brand Equity During a Product Recall Crisis: A Shareholder Value Perspective. *International journal of research in Marketing*. doi:10.1016/j.ijresmar.2015.04.004.
- Hutchinson, J. F., 1974. Procedural Consideration in the Company Recall Program. In E. P. McGuire (Ed.), *Managing product recalls*. New York USA, Ottawa Canada: The conference board.

- Johnson, D., 2009. Toyota recall extended to replace accelerator pedals in 4.26 million vehicles. *Leftlane*. Retrieved from <http://www.leftlanenews.com/toyota-recall-extended-to-replace-accelerator-pedals-in-3-8-million-vehicles.html>.
- Kalaignanam, K., T. Kushwaha, & M. Eilert, 2013. The Impact of Product Recalls on Future Accidents: Evidence from the Automobile Industry. *Journal of Marketing*, 77 (March 2013), 41-57.
- Kollewe, J., 2015 December 10th. Volkswagen emissions scandal - timeline. *The Guardian*. Retrieved from <http://www.theguardian.com/business/2015/dec/10/volkswagen-emissions-scandal-timeline-events>.
- Magno, F., 2012. Managing product recalls: The effects of time, responsible vs. opportunistic recall management and blame on the consumers' attitudes. *Procedia - Social and Behavioral Sciences*, 58, 1309-1315.
- Mayer, T.V.H., Patryk, R.W., & Joosten, J.J.H., 2011. *Products Liability in the United States, Issues for Dutch Companies*. NL Agency, Hughes Hubbard & Reed LLP.
- McGuire, E. P., 1974. Introduction. In E. P. McGuire (Ed.), *Managing product recalls*. New York USA, Ottawa Canada: The conference board.
- National Highway Traffic Safety Administration, unknown. *Vehicle recalls: Frequently Asked Questions*. [safercar.gov](http://www.safercar.gov).
- Schuurman, F. J. H., 1997. Recall, het terugroepen van een product. In J. Maas (Ed.), *Handboek integrale kwaliteitszorg*. Alphen aan den Rijn: Samsom.
- Srinivasan, S., & Hanssens, D. M., 2009. Marketing and Firm Value: Metrics, Methods, Findings and Future Directions. *Journal of Marketing*, XLVI, 293-312.
- Stanwick, A.D., & Stanwick, P. A., 2010. The ethics of outsourcing at Mattel. *Problems and Perspectives in Management*, 8(4), 179-184.
- Story, L., 2007a. Lead Paint Prompts Mattel to Recall 967,000 Toys *The New York Times*. Retrieved from http://www.nytimes.com/2007/08/02/business/02toy.html?_r=0.
- Story, L., 2007b. Mattel shifts into crisis mode after quality problems. *The New York Times*. Retrieved from <http://www.nytimes.com/2007/08/28/business/worldbusiness/28iht-mattel.4.7289869.html?pagewanted=all>.
- Story, L., & Barboza, D., 2007a August 15th. Mattel Recalls 19 Million Toys Sent From China. *The New York Times*. Retrieved from <http://scca-ca.org/PDFs/MattelRecall19.pdf>.
- Story, L., & Barboza, D., 2007b. Toy making in China, Mattel's Way. *The New York Times*. Retrieved from <http://www.nytimes.com/2007/07/26/business/26toy.html>.
- The Gilbert Law Group, 2015. What You Need to Know About Product Recalls and Withdrawals Retrieved from <http://www.thegilbertlawgroup.com/what-you-need-to-know-about-product-recalls-and-product-withdrawals.html>.
- The Rapid Alert System for Non-Food Products (RAPEX), 2007. Notification Reference: 0760/07 Retrieved from http://ec.europa.eu/consumers/safety/rapex/alerts/main/index.cfm?event=main.notification&search_term=0760/07&exclude_search_term=0&search_year=2007. from European Commission.
- Toyota Europe, 2010. Toyota Motor Europe announces recall campaign in Europe for potential accelerator pedal issue [Press release]. Retrieved from <http://www.toyota.eu/about/pages/newsdetails.aspx?prid=501&prs=Corporate&prrm=pressrelease>.
- Unknown, 2010. Toyota recall timeline. Retrieved from http://www.nbcnews.com/id/35240466/ns/business-autos/t/toyota-recall-timeline/#.VbjI_E1dKpo.
- Unknown, 2015. 2009-11 Toyota vehicle recalls. Retrieved from https://en.wikipedia.org/wiki/2009%E2%80%9311_Toyota_vehicle_recalls (July 1st, 2015).
- Wynn, M.T., Ourang, C., ter Hofstede, A. H. M., & Fidge, C.J., 2011. Data and process requirements for product recall coordination. *Computers in Industry*, 62, 776-786.