

THE END-CUSTOMER'S PERCEPTION ABOUT THE ELECTRONIC PRODUCT CODE (EPC) AT A RETAILER

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Abstract: The concept involves an active or more likely passive RFID data tag that stores information on the product that can easily be retrieved by a reader system. Therefore entities in the supply can identify a pallet, a case and increasingly, as the prices of the tag drop even individual products. The consequence will be that the supply chain will become more transparent, since products can be tracked individually. If a product disappears for any reason or is misrouted, the discrepancy can be located immediately.¹ Heavy loss generated by theft and poor planning can be minimized and wholesalers can offer their products with a much better service.

Over the last twenty years the barcode has been indicating the characteristics of a consumer products' specific category. This has been sufficient for many years, but since markets are more dynamic than ever before companies have to adapt quickly to the changing environment. Therefore the Electronic Product Code (EPC), which will be first introduced in 2008, will definitely change the existing business habits and procedures from the ground. According to the consumer industry and their objectives, inefficiencies in the supply chain will be removed and costs can be decreased, which will finally benefit the end-customer.

However on the other hand, there are a number of concerns the consumer industry as well as the end-customer needs to face: the EPC-technology requires a new infrastructure and organization that will cause huge expenses into the logistic.² Regarding privacy issues many consumers reject the new technology so far and companies will have a hard job on convincing them of the great overall value. As trends in the industry have shown, the EPC technology will have an enormous impact on mass products and on a variety of items. The end customers' acceptance of the Electronic Product Code will become essential, whether all the efforts done in the research and development will finally pay off.

This paper presents the results of an exploratory study about the consumers' perception regarding the EPC-technology and how it could affect their purchase habits; the study focused on consumers of a specific supermarket chain (HEB in Monterrey, Mexico) I will thanks to the master students for your collaboration in this empirical study .

An already existing research study about the US end-customer perception regarding the EPC technology was conducted by Capgemini in October 2003 and served as an outline for this project in order to better compare the final results.

JEL classification: M10, M31

¹ Ibid

² Hammonds, T.: Chain Storage, May 2003, p. 30

Key words: customer; product; code; retailer; perception

1. INTRODUCTION

As globalization triggers for some drastic changes in most businesses and industries, companies need to face the challenges of continuous improvement to stay ahead of their competition. In order to survive in those hard fought global markets and to quickly adapt a company's business to the changing market conditions, companies are forced to come up with new ideas to attract their customers in a more appealing way.

Therefore especially retailers and wholesalers in the consumer industry are encouraged to meet customers' needs and demands. In the recent years technological breakthroughs and innovations came along with a far shorter life-cycle than ever before. The introduction of the RFID- and EPC technology will bring some major changes and adjustments to all participants involved in the supply chain.

These facts also call for first RFID trials in Latin America. Studies have shown that there are already sufficient resources and equipment available in order to get started very soon and to implement such new demanding technology. Since the most Latin American countries – among them Mexico as well - still lack sufficient knowledge of how to implement such a new technology in the supply chain and how to educate the end consumers in a way that they clearly understand the benefits from its introduction. Most customers have not yet come in contact with tagged products like the RFID / EPC technology brings along, and the infrastructure required for a smooth process.

Public media does not cover the topic very well in detail so far and when something comes up, information is mainly positive and not very well-scrutinized. Moreover data protection laws are rare and only a couple of private consumer activist groups concern about the legal issues. Therefore the industry should consider these conditions of missing legislation as an opportunity in order to position the new EPC technology in the consumer's mind. The general lack of information in Latin American countries causes an undecided attitude and rather positive opinions towards the introduction of new ideas and technological enhancements. This shows that consumers especially in underdeveloped nations need to be educated and involved at an early stage in order to assure a further success of the launching process of the still fairly unknown Electronic Product Code.

Former studies in Mexico revealed that there exists a positive mid-set for innovation without any trend or tradition for resistance against progress. According to consumer interviews from 2003 Mexicans relate modernization to further growth of the economy and are interested in developments that support the country's economic prosperity.³

Since consumer loyalty cards and data mining by retailers are not frequent procedures yet, customers generally show more trust towards such information systems than consumers in more developed nations do. Economic liberalism and innovations are seen as major impacts to Mexico's development and therefore the country's 'big brother' in the North – the United States - is considered as a paradigm that has to be pursued. However companies should also be aware of the important role that local

³ Schnörzinger, S.: The Impact of Public Opinion on the Spread of RFID Technology – From a Latin American Perspective

institutions like supermarkets and media play in terms of promoting the revolutionary EPC technology.

As studies discovered major concerns of Latin American consumers are in some kind the loss of privacy and health risks that could emerge from the RFID tags added to consumer products. Nevertheless these issues did not worry people in such a strong way compared to similar studies carried out in Western countries. In fact it can be recognized that there are some key barriers affecting the introduction of the mentioned technology in Latin America, but on the other hand hurdles seem to be way lower than in more developed regions of the world. Therefore supermarket chains should take advantage of the fact that local consumers are mainly interested in innovation and new technology serving them in a more efficient way.

2. RESEARCH OBJECTIVES

The purpose of this project was not only to gain knowledge about the general impression of end-customers in Monterrey, Mexico towards the RFID and EPC technology but also a comparison of an existing study about the end-customer's perception of this upcoming technology in the USA (conducted by Capgemini in October 2003). Therefore the Capgemini research study was considered a fundament for the presented EPC-study in Monterrey, Mexico while the surveys were adapted to the local requirements.

3. HYPOTHESES DEVELOPMENT

Our hypothesis is that even though it may be difficult to assimilate the EPC technology at the beginning, the positive factors will be more significant than the possible negative factors that the consumer may find in this technology. The EPC technology will definitely penetrate the market for mass products in the next years, and therefore it is essential to get an idea of the possible reactions of the end consumers. This study will serve as a tool to analyze the general perception of Mexican consumers in order to promote the technology in a clear way and to make them understand the benefits of the EPC.

4. COMMON USED LITERATURE

Since the mentioned Electronic Product Code, EPC is still a fairly young technology the investigation established that there is endless information available about the subjects of RFID and/or EPC-technology. This is generally found in form of articles in newspapers and specialized magazines and periodicals; however the vast majority can be gained from articles within the consumer industry in the internet in order to represent the current debate. Most of the data is up-to-date, but there is also a wealth of historical information on-hand that covers the related topic Efficient Consumer Response.

5. METHODOLOGY

The composition of the consumer sample was based on a projected sample representative of the population in Monterrey, Mexico from the standpoint of age, gender, education and residential location. Hereby consumers were asked to complete a questionnaire that included a brief explanation of RFID and a wide range of questions

regarding the technology, as well as basic demographic questions such as gender, age and education.

Regarding the method which was used in this study, it was necessary to determine the sensibility of consumers due to their response on the Electronic Product Code technology (EPC). Therefore the project team decided to focus on a specific market and which would be segregated to a supermarket from Monterrey, Nuevo Leon:

Consumers from a supermarket (HEB) in Monterrey:



How can we estimate the response of the customers regarding EPC in the supply chain?

In the following two methods of investigation within the study project are described:

Interviews:

In this kind of research the project team intended to personally talk to people to gain an impression about their feelings and opinions the EPC technology triggers.

Surveys:

This research is also undertaken on the condition of a formal survey in which it was first necessary to determine the segments of people the study was focused on (ex. age, sex, product preferences, etc...). Since the has been the intention to concentrate on the “average” citizens living in Monterrey it was indispensable to find an appropriate district representing the common inhabitants in order to carry out the surveys. Afterwards a detailed evaluation of the data has been done and conclusions were derived from the analysis.

Design of the survey

The study was based on interviews elaborated through 152 surveys in one supermarket of HEB. The interviewees represented representative end-customers of the HEB chain in the metropolitan area of Monterrey.

In order to receive satisfying results it was necessary to calculate the sample size of how many interviewees will be required to get satisfying results:

Population: HEB customers in the district “La Fe” of Guadalupe

Estimated size of population: > 100.000 HEB consumers in Monterrey

Sample size: 152 surveys

According to calculations it was figured out that a size of 150 questionnaires would be sufficient to get satisfactory results with a potential error rate of approximately 8%. Due to the pressure of time it was not able to carry out a number of at least 400 interviews, but as it is shown in the table, this would just have reduced the error rate of the final results by 3%. Therefore the team decided on interviewing 152 end-consumers of the HEB supermarket chain.

The investigation process consisted of two steps: at first the most representative and most appropriate supermarket has been selected (out of seventeen HEB stores in Monterrey). Furthermore the required end-customers have been chosen by chance. Moreover the study has been compared with a similar research undertaken by CapGemini Ernst & Young Consulting: RFID and consumers – Understanding their mindset where the objective has been the comparison between the American and Mexican consumer regarding this technology. The questionnaire was designed to meet

the objectives of the study and the HEB chain. It was expected that the interviews will not last longer than 7 minutes.

6. ANALYSES AND RESULTS

Regarding the surveys applied to consumers of HEB in Monterrey, it was realized that the concept of Electronic Product Code is not known at all. The chart shows that 97% of the persons didn't know about EPC. In Mexico the RFID technology has not been introduced to a consumer level, and the concept looks hard to understand for most people (*Figure 1: Knowledge about RFID Technology*).

General Consumer Perception of EPC

Even though most of the consumers answered that they never have heard about the RFID technology, they received a brief explanation of the concept before the surveys, so they could be asked about their perception or a possible perception of the new technology. The most common answer was "I don't know" in 62% of the cases. That means that those people do not feel comfortable emitting their opinion about a concept that they do not know, yet. 23% of the consumers think the concept of EPC is favorable, and 12% showed an unfavorable perception. The lack of knowledge is the main problem here. The results are not that precise because for the end consumers it seems hard to answer questions about things they do have not heard about and it is complicated to understand the concept in just few minutes (*Figure 2: Customer Perception of RFID Technology*).

Impact on Price due to Introduction of EPC

Based on the influences of EPC, it is valuable to know how people think about the impact this technology will have regarding the price of goods. 34% of the consumers answered that they do not know if the price will increase, decrease or even stay the same. In this chart, as it is described before, the primarily answer is "don't know". This is easy to understand when we take the answers of the first chart into account where 97% of the interviewees answered that they have not heard anything about the concept of Electronic Product Code. 33% of the consumers stated that they think the price will be the same. They don't think the introduction of EPC will affect this issue. 24% answer that the price will be increased regarding the introduction of EPC and only 8 % think prices will decline (*Figure 3: Impact of RFID on Cost of Goods*).

Customers' Benefits from the Technology

The benefits that Mexican consumers consider most important are those ones related to improve the security and quality. This is maybe because these are key topics in Mexico these days. Moreover, the benefits related to consumer savings and the right price information tend to be very significant, too. In contrast the benefit of getting a faster checkout seems to be less important than others – the reason is that Mexican consumers generally like shopping and see such a trip as entertainment where the whole family takes part. Maybe consumers in Monterrey got used to spend a certain amount of time in the checkout which is part of the visit. However consumers in Monterrey did not show too much interest in benefits like getting more product variety or product suggestions in the store (*Figure 4: Importance to Mexican Consumers of Potential Benefits from RFID*).

Consumer Concerns

Consumers in Monterrey are concerned about topics related to health and privacy. Figure 5 shows that privacy issues represent the biggest concerns stating that

personal information could be used by third party. In contrast to this, end consumers do not consider the problem of receiving more direct marketing as very serious (44%). Thus, before the RFID tags get reality, supermarket chains need to establish promotion campaigns in order to inform and communicate the key benefits of the technology to their consumers. Moreover companies have to find ways to convince consumers of the actual advantages EPC brings along and to get rid off existing myths that could be in their minds. Consumers in Monterrey are affected to technology and they seem to be open to it, but nevertheless it is necessary to inform them well to prevent a possible rejection or bad perception of this technology (*Figure 5: Mexican Consumer Concerns related to RFID*).

The implementation of RFID

End consumers' views on the RFID timeline are not aligned with industry estimates, which anticipate RFID introduction arriving within several years. So we need to keep in mind that almost half of the interviewees we surveyed responded that "they do not have any clue of when EPC will become reality". Figure 6 depicts the consumers' perception that the RFID technology will be ready for general use in the upcoming years. Therefore only about 27% of the respondents said that the technology will be applicable within the next five years, while 16% thought it will take longer than this period to successfully implement it. The remaining 11% thought that the technology will never become reality (*Figure 6: Time to become Reality of the RFID Technology*).

In general demographic factors do not make an important difference in the way the consumers think about the RFID technology. However it was found that women rate the benefits higher which are related to security and health than did men. Women showed the same behavior about concerns related to privacy, health and the impact on the environment. Women's interest in security and health factors is certainly because in Mexico women are in charge of the family care - they usually do the shopping for them and they feel responsible for the family's well being.

The respondents between the ages of 31 and 50 tended to give more importance to benefits such as faster recovery of stolen items, improved car anti-theft capabilities, consumer savings due to reduced costs, improved security of prescription drugs and improved food safety/quality. They were also more concerned about issues like health and privacy. This group tends to respond in a different way, because they form the part of the active population of the country, since they usually work and tend to be more responsible and participative. People with professional studies tended to rate higher than other groups the benefits like faster recovery of stolen items, improved car anti-theft capabilities, improved food safety/quality. Furthermore they were the only group that showed more interest in the benefit of a reduction in counterfeiting products.

7. CONCLUSIONS

The objective of this project was to provide an analysis of the end consumers' perception of the EPC / GFID technology, which is about to be introduced within the next couple of years. Therefore some findings of how to treat and educate the process of implementation were shown in order to make the revolutionary technology a successful one in Latin America. In order to launch RFID – EPC technology in Mexico, companies first have to create an information campaign about the benefits, uses and consequences of this new technology. People in Monterrey, do not have knowledge about this and it will be possible that they can create a negative perception if they do

not receive proper information about it. Retailers will have an enormous benefit in costs and savings in the implementation of EPC in their logistics process and even inside the store, but it will be the final consumer who will be in contact with these changes and they need to be prepared to assimilate them.

The study found out that generally people do not know and do not understand well the technology and its benefits. Most of them could not give an opinion about the RFID and some of them had a negative perception. In a country when most of the population is worried about saving money, it will be dangerous for retailers to give an impression of being more expensive projecting an image of a high tech supermarket. It will be necessary to educate the consumers and try to communicate the new technology in a friendly manner and in a common language so people can familiarize with the new code and adopt it without concerns.

Moreover it will be useful to communicate to consumers the actual applications and give clear examples of the benefits that will matter most to them. Therefore it is very important that the final consumers are prepared to adopt the technology in order to have a complete success in the launch of RFID technology. The information campaign should debunk myths and possible concerns and try to portray the technology as a tool for the consumers to get more savings and better service. It will be necessary also to pay attention to the concern about loss of jobs, because it is a topic that people relate to technology advances and they think it will be easier and cheaper to retailers to substitute people for machines or computers. The campaign should be address also for people who work inside the stores and let them know that the technology will not substitute their work. In contrast it will be a tool for them to do their duties more efficiently and they could offer a better service to consumers. The campaign should focus on women who are more involved and seem to be more concerned about their family well being and also more interested in the benefits that the new technology can give to them. The RFID will be reality in some years and it is necessary to prevent negative reactions before the technology is launched. Consumers of HEB in Monterrey are open to get improvements that can make their life better and more comfortable but it is necessary to educate them in order to adopt and accept the technology and make it part of a better shopping experience.

The true value of the research project can be found in the acknowledgement of customer demands for greater market information about innovative technology. So far especially underdeveloped economies lack of an accurate customer communication, which would help the population to better understand the needs for progress. Besides product availability and faster recovery of stolen items at a fair price-performance-ratio are one of the key benefits consumers expect form the implementation of EPC, so the consumer industry should take that into account when communicating the technology to Latin American consumers.

It is hoped that this research project will contribute to the industry by describing the practicability and ease of application by which such a market investigation can be used to illustrate the current situation and trends regarding a special technology. Care should be taken in trying to transfer these findings to other countries or industries, as the results are highly dependent upon the information gathered from documents, surveys and interviews and the process of analysis detailed herein.

Have You Heard of RFID Technology?

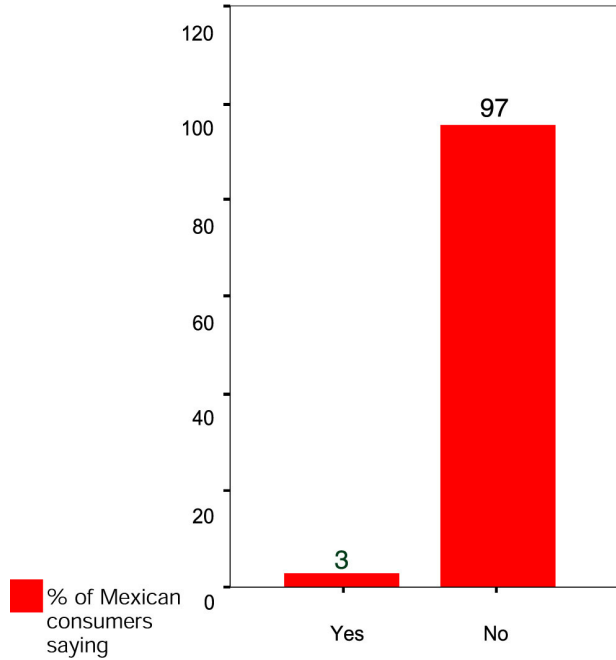


Figure no. 1: Knowledge about RFID Technology

What Is Your Perception of RFID Technology?

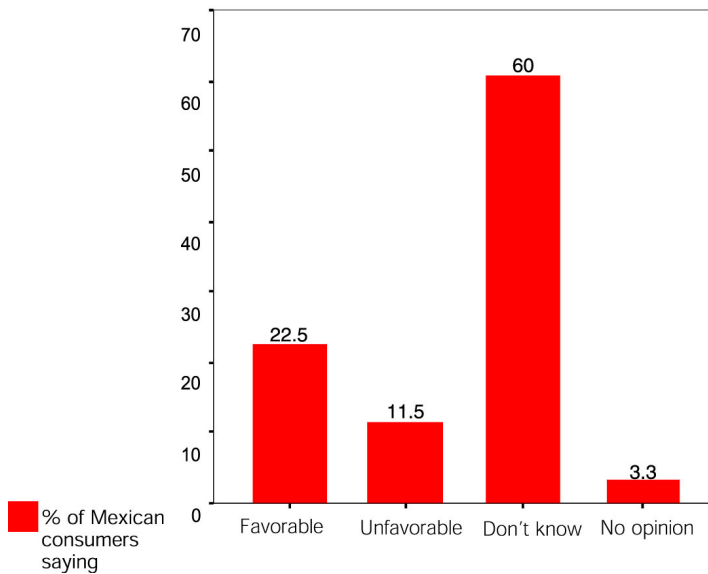


Figure no. 2: Customer Perception of RFID Technology

Impact of RFID on Cost of Goods

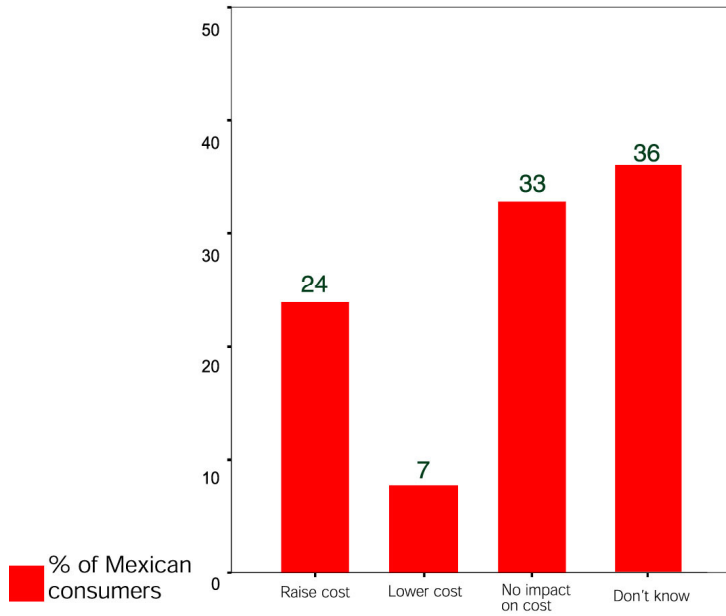


Figure no. 3: Impact of RFID on Cost of Goods

Importance to Mexican Consumers of Potential Benefits from RFID

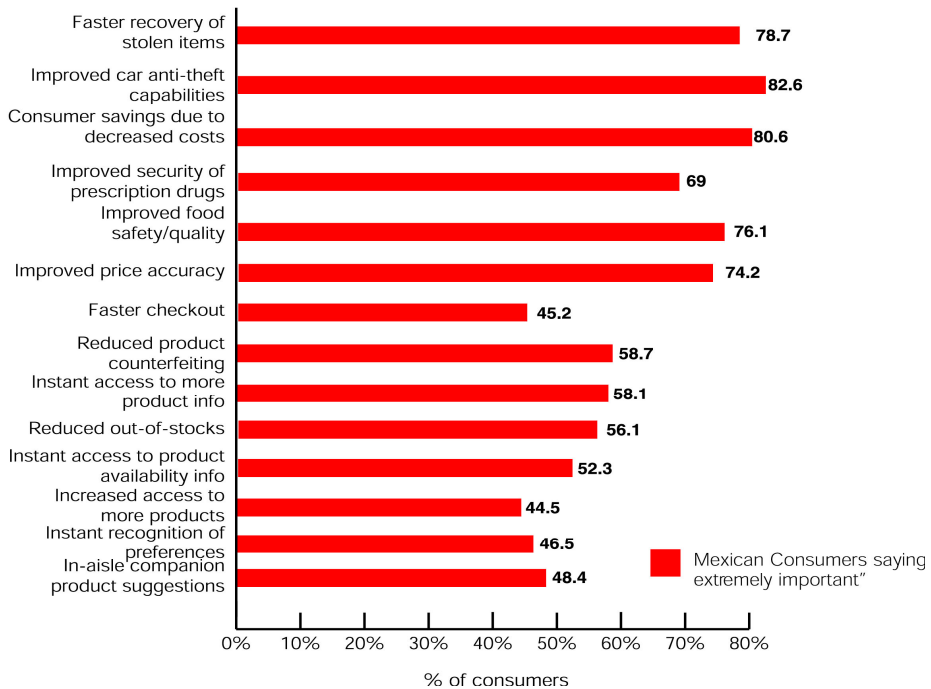


Figure no. 4: Importance to Mexican Consumers of Potential Benefits from RFID

Mexican Consumer Concerns Related to RFID

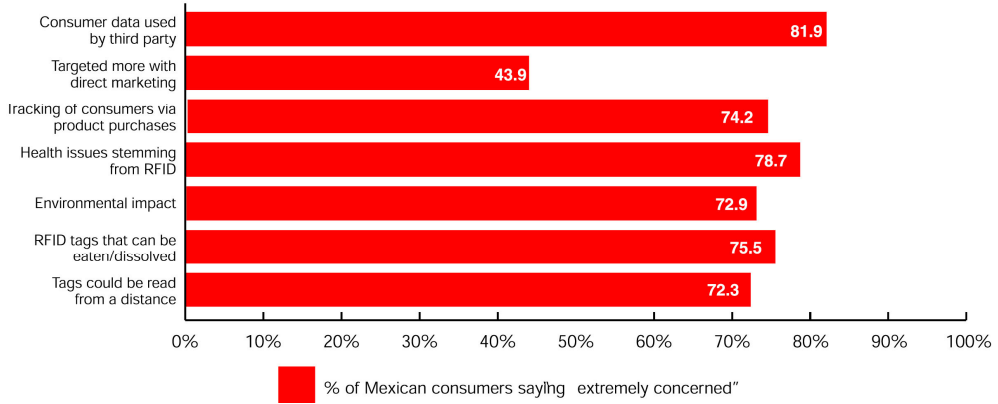


Figure no. 5: Mexican Consumer Concerns related to RFID

How Long Until RFID Is a Reality?

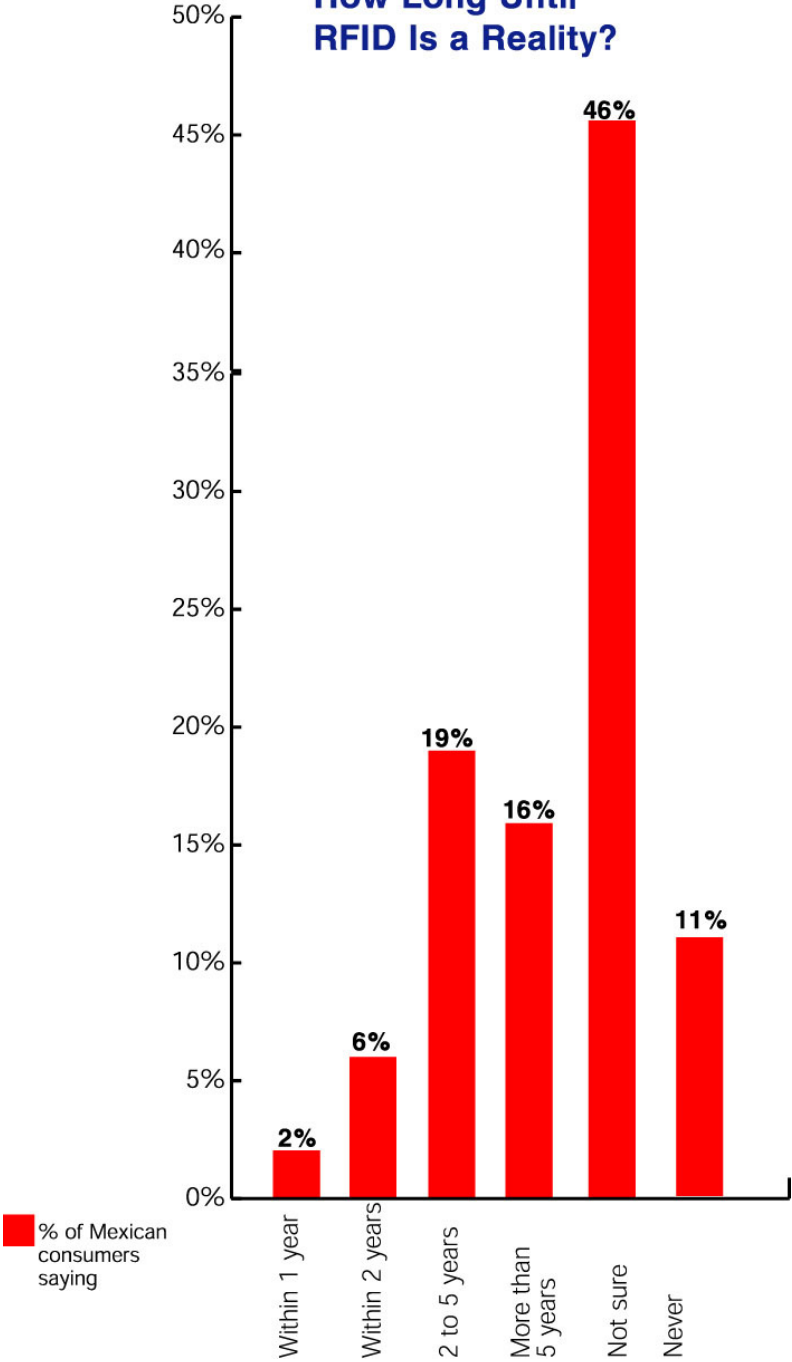


Figure no. 6: Time to become Reality of the RFID Technology

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