

Dan MITREA,
Doctoral School, Faculty of Economics and Business Administration,
Transylvania University, Brasov, Romania

NEAR FIELDS COMMUNICATIONS – FROM TOUCH TO TAP MARKETING

**Empirical
studies**

Keywords

NFC Marketing
Tap Marketing
Internet of Things
Complex event processing
SAP CS

JEL Classification

M31

Abstract

The Machine to Machine (M2M) Market, according to Digital Research (2012) was 121 bn. \$ in 2010, and was estimated by Digital Research to be 948 bn. \$ for 2020. The so-called non-connectivity revenue (no human implication) will rise from 3% in 2010 to 25% in 2017, meaning no human interaction will be necessary to retrieve certain machines data. The data models processed from the information gathered here, can certainly predict clear consumer behaviors. Near Filed Communication has its own capacity to be part of the internet of things, as an interaction meter for human reactions to environment. Juniper Research (2014) on NFC, splits his marketing potential between smart posters, coupons, smart tickets for public transportation, consumer goods information, electronic wallet, but also on social media, smart homes, smart cars or even smarter cities.

1. Introduction and Background of Near Field Communication.

As a new concept Near Field Communications NFC - near field communication Gartner (Gartner 2014) estimates that this concept will reach maturity between 2013 and 2016. Mobile Marketing Welt Company (MMW Company 2013) has a short history for NFC concept: it was developed in 2002 by Sony and NXP, this standard is based on RFID (Radio Frequency Identification) so this technology is mobile and thin enough to be placed in the NFC label. It has a Peer to Peer protocol, using RFID on low range. According to Xcubelabs (Xcubelabs 2014) a short definition on NFC would be: NFC is a ISO18000-3 RFID compatible, with a data transfer rate of 424kb per second, frequency 13,56 MHz and an operating time less than 0,2 seconds and distance less than 20 cm, the power consumption is under 15 mA, less than writing an SMS. An NFC Tag supports up to 10000de rewrites, has a diameter of 2.5 cm and thickness of a sheet of paper it can be read by touch with a smartphone.

NFC Enablement (Nick Valmy Infographic 2014), is a new feature of the last released mobile hardware, and brings a growing element to the number of potential users worldwide. A first approach would be, to remember the early 2000 and the WAP technology integrated in the mobile marketing models. According, to Peil (Peil T 2005) however, the pieces of the puzzle did not have the effect counted in that time, regarding several technical constrains and user constrains.

We learned we need to have some functionality, but at the same time, technology has to be used in an easy way and to be user friendly. However, in order to talk about a mobile marketing, certain parameters have to be reached in order to consider the processing capacity of devices, the speed of connection, different applications- able to work with marketing data, and the critical amount of users using it. If these assumptions are met, then we can experiment a marketing approach on the NFC technology.

Compared with NFC, the QR Code technology requires the installation of an application, a download of a QR code that has to be scanned, and an application to do that. NFC communication is done by touching the mobile phone to the label containing RFID ring and hardware, as exemplified by Marketing Tech Blog (Marketing Tech Blog 2014) This NFC tag can be embedded in a poster, promotional material, mobile point of sale, applied as a sticker on a glass, a door, a car and so on.

2. NFC product lifecycle slope and correlation with edge technologies.

A marketing research from Markets and Markets (Markets and Markets 2014) shows that NFC has a standard annual growth rate of 38%. Therefore, for

2016 a world market was estimated \$ 10 bn. for NFC. NFC applications include ticket area, booking tickets, payment by mobile devices, access and permit area, access control, time-sharing, advertising and infotainment. In the same category are considered products including SD cards, integrated SIMS cards, card readers and microchips. The growth is more likely to be in advertising and ticketing area. The NFC can exchange information and subsequently underpin the opening of complex transactions by making some necessary settings automatically, on wireless communications. The response time in case of NFC Communication is 0,2 seconds compared to 6 seconds for the Bluetooth. NFC can communicate between two devices that have NFC chip or, between a device and a so-called "tag", or label NFC.

Gartner chart shows the so-called HYPE. Although GARTNER cycle, as shown in figure 3, places NFC in an area with technologies that disillusioned, we would like to connect this idea of using NFC with some others technological triggers. Market entry is more difficult for NFC because it was excluded from Apple Technology. It was not included in iPhones or iPad. The consideration was rather the "unsafe" and "non-standardized" NFC Payments capacity of NFC, yet being known the fact that there is certain on-standardization in this area. Drew (Drew Strategy Marketing Technology 2014) means that Apple missed the point with NFC; we will see that in the near future.

Let us however, link the NFC idea to some other climbing technologies. First Machine to Machine communication, second the Consumer Telematics, then the Crowdsourcing, the Internet of Things, complex event processing and social analytics can be driven in the future also from this simple device NFC. It has to be recognized that NFC has the capability to provide tracing, tracking, monitoring and aggregation of consumer data according to Stamford. (Stamford Conn. 2012)

The „Voice of the Consumer" becomes a cloud implemented concept. This may be considered for extraction of certain marketing data analysis on consumer behavior. In this regard, the use NFC (with geo-location and date, time data) can be linked up with the different consumer blogs or forums. Correlation with the concept of CPM cost per thousand impressions (Duguleana & Duguleana; 2008) can have here a certain relevance. The visitors download those impressions linked up with NFC, every time, and the number of views of the certain marketing messages counted.

At the Consumer Telematics concept – there were mentioned various applications around the concept of telematics also enabled by NFC - which integrates traffic information, local search objectives, GPS data, emergency first aid and similar. By addressing "the internet of thinks", this

concept can be extended to other appliances used in households.

The described concepts: the “internet of things” and the “complex event processing” that can be associated with NFC and are used by mobile application to: automatically recognizing content, analysis of data from social networks, identification of tipping point (tipping points recognize of tablets), measurements of internet traffic indicators and other socio statistics data.

3. Ways to use NFC tap and touch marketing.

3.1. Discount store products.

Is it indeed an effective way to buy consumer data? By uploading a NFC tag with coupons, company offers a discount code in a certain percentage of the product. In exchange, customer provides certain data: GPS position, date, time, e-mail (contact details). Here we can consider loyalty contracts or membership in a particular campaign. Pass entry and get event information can be also associated here. Zapa Technologies explains how it works (Zapa Technologies 2012): once the NFC Coupon is tapped, the coupon is validated with the customers data (Name, town, age,) sent through SMS automatically or as email when WIFI or 3G is available. This coupon can later be used, to buy the products in the marketing campaign. (Figure1, figure 2)

3.2. Public transportation and tourism.

And this is possible without the need for a communication infrastructure. In addition to reducing the fixed costs of issuing a paper ticket, benefits related to sending promotional information and tourism, language settings and pictures are targeted. Replacing plastic cards is so advantageous, especially those that wear out the paper after several uses. Ticket can be purchased before arriving in a city (or country) and stored in the phone and use the destination itself through NFC. Buying tickets can be done in several ways, with bidirectional information exchange: both retrieving customer’s data, and offering further data to the customer: direction information, weather, see-sights. Also by2015,NFC Times Predict (NFC Times 2012) over 500 million customers are expected to use NFC for metro of bus ticket, and for after booking payment, especially for town-visitors.

3.3. Method of payment.

NFC can be used in four types of virtual payment: Google Wallet, ISIS Wallet, Sprint Touch and MCX. Payment can be made in the four standards listed, without going into technical details. A review done by CITA Wireless (CITA Wireless 2011) insists on using NFC as a payment instrument, but the lack of standardization does not have the desired potential. Clearly it can be used with the marketing purpose correlated to the

payments. Regarding this direction Google (The Google Company 2014) tried to impose a NFC standard through Google Wallet, but for the moment with a rather modest market feedback. Payment is directly linked to the loyalty points, get and use coupons and discounts, share information and coupons among customers. NFC Times (NFC Times 2012) predict that amounts spent trough mobile payment should be around 2.5 Bn.\$ by 2015.

3.4. NFC Social Media.

It is about music, theater, stadium, access to skiing, and buying a cinema ticket. Here NFC can be used bidirectional, as NFC payments and wallet and for booking. When buying a cinema ticket through the NFC tag located in the advertising, the customer receives a possible reduction. If an event is traded by the NFC tag, then transactional cost and paper is saved. NFC enables download and personalization for event application, download tickets and access to events, checking also history usage. In this regard, data will count because: a) Complex promotional material placement in areas where sufficient pasting a poster. b) Reading some data of consumers - consumer patterns and approaches in exchange for a discount. Erkki Siira and Vili Törmänen (Siiraand Törmänen 2010) presented an NFC-based multimodal social media application. „This application allows users to make friends by touching other users' NFC devices through the peer-to-peer mode. Users can also inform friends of their current location by touching hotspot tags.” (Siiraand Törmänen 2010)

3.5. NFC Smart Posters.

Customer’s users are called to action to engage in the services offered in an active way. The advantages named here by Enlighten (Enlighten Company 2012) are: Precision: location based information browsing; Easy of use – redirection to a program or to a website; Environmental benefits: coupons, special offers, company information without paper support; Convenience because NFC can store a range of different information.

3.6. Smart Home NFC settings.

Starting with smart NFC locks, that can look and unlock by NFC (even by distance). Once at home, reading the NFC can disable 3G and enable WIFI, change ring volume, but also stream different materials to a smart TV or Computer. Interconnecting with smart meters in home also sets up temperature, humidity and some others parameters for home. It can post an order for pizza of home delivery (Reading - writing a shopping list on the fridge).

3.7. Car NFC Settings.

Reading the NFC Tag in the car, securely open the doors, change phone to hands free profile, start Bluetooth for voice options, enable GPS and upload a map for navigation. Llama ID application (Kebab Apps –on Google App-store; 2010)

currently uses the GSM cell location area, can be also associated with the NFC. In addition, the NFC commands can adjust seat position, pay parking fee, and play favorite music, load GPS position and load router to destination address, lock doors. If the connection between the NFC functions and the car are possible and more detailed, then the area of the "internet of things" is touched, and the amount of relational marketing data exchanged here, will grow.

3.8. Office NFC settings.

NFC can be used for identification at the entrance and office building. By programming a profile that starts NFC primarily an auto-synchronization of calendar, tasks, auto-reply; also orders and preorders at the cafeteria menu by reading a certain NFC tags. Transfer v-card between two devices with NFC and between NFC tags and a device. Such party data are loaded directly into the phone's address book. Exchange business cards – access PC and office smart building setup.

3.9. Smart City settings – NFC Utility Meters.

NXP Company enables first demonstration on how to use the NFC enabled device to read wireless smart meters. (NXP Press Release 4 October 2011). The link to the concept "The Internet of Things" defined as a correlation of networking and network events, between devices and machines, introducing the concept of "Complex Event Processing".

4. NFC tap marketing – SWOT analysis.

By the variety use of NFC tags, it is possible, like described, to gather different consumer and customer information. In the most of the cases, information is linked to an event, triggered by scanning the NFC tags, event that can be defined, in space and time, and allocated to a certain user, or user information or profile. If the scanning of the NFC tag on a poster in instance, is followed by some other actions of this certain customer, then valuable data about interest on products and services are gathered. To create a NFC Marketing campaign a company will use various implementations of the NFC labels or tags, in the same time prepare certain mobile application and content readers, and prepare to storage and valuate the customer information that will flow in. It is clear that a certain interaction-coded in-between the use of this NFC tags can bring in data that are more valuable from the customer. Tags can write and reside up to 10,000 times the information that lead the execution of certain commands, so a scheme to recover the tags should have his meaning. In a few words, the SWOT matrix would have following structure – Figure 4.-

5. NFC tap marketing mix

Wiedmann, Reeh, and Schumacher (2010) are proposing a marketing mix for mobile marketing

that can be applied to the NFC technology. The marketing mix will contain following elements:

5.1. Communication

Smart poster – NFC build in (considering reusability); Location based Service (Museum, Bus, Train) – NFC communicate geo-location; Deactivator Touch Point – NFC; Transfer Data from Utility meters trough NFC

5.2. Distribution

The Digital contend – RFID – Download NFC can contain 4096 k Data of instructions; Physical content – RFID - Product-recognition, Product-association with base product; Mobile Payment – NFC –Authorization; NFC – Wallet.

5.3. Product

Digital Product – NFC Ticket (Museum, Bus, Metro); NFC Enabled Poster, Added Value through NFC Product-information, Company-information; Marketing-positioning – the NFC Image as technology.

5.4. Price

Electronic Wallet, (Google Wallet, 2012). Discount and Rabat trough - NFC download of coupons; used afterwards in stores or online. Discount by NFC Download – reading of an item, tag – downloading an application; NFC Product - Price comparison tools.

6 Conclusions

As conclusions, I would recommend thinking of some mobile application optimization and the market value and data gathered from here.

NFC is able to empower the use of new interaction channels in marketing, mobile application can be optimized using NFC technology. Let's take as example the travel request for employee, booked at this moment with the standard ERP solution from SAP on the desktop module and functionality of SAP FI TV. The travel data is transferred via mobile application SAP Travel Expense Report (SAP AG,2014) but not accessed by NFC. Travel receipts are photographed at this moment, sent as attachment, and allocated manually to a cost center. Now we can imagine the action of the NFC technology, reading NFC tags and fly tickets, coupons, paying with NFC wallet, booking meals and checking in rooms, checking in and out from the customer office, using car settings, and so on. NFC will also use GPS and location data, time, date, and transmit automatically this certain data to the SAP desktop application in order to book and claim the expenses. Certain data can be sent automatically, and for other data, a short validation might be necessary from the customer, but no further manual data insertion would be needed. Beneath that, certain electronic tickets for bus, museums, or leisure can be also stored and valuated as object of claiming. Important information on travel behavior can be read, if not directly, than upon correlated parameters. Marketing data

gathered in this way can set up a related content: air transportation, info-tourist, restaurant quota, tourist-events.

On „the internet of things” approach - entire hardware parts, devices or equipment, are able to “socialize” and transmit data to each other. In this case, the use of NFC will empower the interactions with consumer behavior. This approach, expected in midterm future, to be used in marketing purpose, aggregated data from “internet of things” or “complex event processing”. The main advantage of those data: they mostly do not implicate any kind of human consumer interaction. In this regard, the new type of utility meters, use NFC communication instead of a display. The sources of information here, is not the customer directly, as we rather know it, but the objects, equipment and devices used by consumers. In this area, it is to be considered the link and correlation between an ERP software for CRM Customer Relationship Management Applications like SAP CRM Mobile (monitoring the devices at customers) and SAP ERP CS Customer Service and PM Plant Maintenance, counting the repairs and spare parts for equipment back to the factory. The entire flow of information, from customer with the hardware devices to be repaired, the repairing planning plant in charge with customer service, the work groups programmed for doing the repairs, then the materials involved, runs now in most of the cases, through CRM software used by employees. Thinking a step further and using NFC, those devices can be linked to the customer service plant directly with sensors and trough utility meters. Therefore, extraction of metrics for marketing mix from equipment, devices and hardware is here possible.

Since his first contact, back in 2004, the NFC Standard has been in continuous grow. It is clear that this technology has a certain Marketing potential, through multiple interactions with and without the customer directly. His potential is not only, in bringing content for the companies related with consumer behavior, but also bringing the consumer to a more social experience and growing.

Acknowledgement

The research presented in this paper is supported by the Sectorial Operational Programme Human Resources Development (SOP HRD), ID 134378 financed from the European Social Fund and by the Romanian Government.

In addition, I would like to express my gratitude to Prof. Dr. Liliana Duguleana, (Transylvania University of Brasov) for the support along the research.

Bibliography

- [1] L. Duguleana, C. Duguleana, (2008), “Marketing Industry in the Digital Era”,

- Proceedings of the 6th WSEAS International Conference on ENVIRONMENT, ECOSYSTEMS and DEVELOPMENT” (EED’08), Cairo, Egypt, December 29-31.
- [2] Digital Research (2012), Sponsored by SAP AG, [Online], Available: <http://digitalresearch.eiu.com/m2m/infographic>, [18March2014].
- [3] Juniper Research Ltd Basingstoke, Hampshire, RG21 7QW, England, [Online], Available: www.juniperresearch.com, [09February2014].
- [4] Mobile Marketing, [Online], Available:
- [5] <http://www.mobilemarketingwelt.com/>, [02 April 2014].
- [6] XCUBE LABS, [Online], Available:
- [7] http://www.xcubelabs.com/nfc_infographics.php, [014February2014].
- [8] RFID Shop, [Online], Available:
- [9] <http://www.rfidshop.com/38mm-label-mifare-ultralightnfc-777-p.asp>, [02 April 2014].
- [10] Gartner 2014, [Online], Available:
- [11] <http://nfcme.com/gartner-says-nfc-is-2-to-5-years-away-from-maturity/>, [15March 2014].
- [12] Nick Valmy 2013, [Online], Available:
- [13] http://nickvanvlymen.com/images/NFC_infographic.jpg, [12February2014].
- [14] Peil T., Pleil T; Hampe, J F; Lehner F; Pousttchi K; Rannenberg K; Turowski K; (Hrsg) (2005), Anmerkungen und strategische Ansätze zur Kommunikation von M-Payment, in: Mobile Business, Bonn, Page 74-86.
- [15] Marketing Tech Blog 2014, [Online], Available:
- [16] <http://www.marketingtechblog.com/near-field-communications/>, [07February2014].
- [17] Markets and Markets 2013, [Online], Available:
- [18] <http://www.marketsandmarkets.com/>, [09 April 2014].
- [19] Sarah Clark:
- [20] „Gartner places NFC in trough of disillusionment“ (16 Aug 2012).
- [21] <http://www.nfcworld.com/2012/08/16/317281/gartner-places-nfc-in-trough-of-disillusionment/>, [12February2014].
- [22] Drew – Strategy Marketing Technology – 08 October 2012, [Online], Available:
- [23] <http://thinkdrew.com/#/apple-misses-the-point-by-excluding-nfc/>, [18February2014].
- [24] Stamford, Conn., 16 August 2012, [Online], Available:
- [25] <http://www.gartner.com/newsroom/id/2124315>, [04 April 2014].
- [26] 11th Annual Consumer Telematics Show 2013 - 7 January 2013, Mandalay Bay, Las Vegas, NV, USA, [Online], Available:
- [27] <http://www.telematicsupdate.com/cts/>, [01 April 2014].

- [28] CITA Wireless Association – Top Ten Review 06 May 2011, [Online], Available:
[29] <http://www.toptenreviews.com/>, [15 February 2014].
- [30] The Google Company, 10 November 2011, [Online], Available:
[31] <http://www.google.com/wallet/>, [01 April 2014].
- [32] Zapa Technologigies, Mobile World congress 2013, [Online], Available:
[33] <http://www.zapatechnology.com/zapa-coupons.html>, [14 February 2013].
- [34] NFC Times, Forthwrite Media SARL and NFC Times 2013, [Online], Available:
[35] <http://nfctimes.com/news>, [05 April 2014].
- [36] Erkki Siira; Vili Törmänen (2010), The Impact of NFC on Multimodal Social Media Application
- [37] IEEE Computer Society Washington, DC, USA , ISBN: 978-0-7695-3998-0 Pages 51-56.
- [38] Enlighten Company; How to use NFC tags and readers to create interactive experiences that benefit both consumers and businesses; White Paper, April 2011, [Online], Available:
[39] <http://www.smartposter.co/what-is-nfc>, [01 April 2014].
- [40] NXP Company, Press Release 4 October 2011 [Online], Available:
[41] <http://www.nxp.com/news/press-releases/2011/10/NFC-Enables-Secure-Wireless-Access-to-Smart-Meters.html>
[42] [27 March 2014].
- [43] Wiedmann, K.-P.; Reeh, M.-O. Schumacher, (2010), Near Field Communication im Mobile Marketing; Einsatzmöglichkeiten und Akzeptanzchancen;
- [44] Llama Application – Google Appstore, October 2012 [Online], Available:
[45] <https://play.google.com/store/apps/developer?id=KebabApps>, [14 March 2014].
- [46] SAP AG – SAP Travel Expense Report, October 2012 [Online], Available:
[47] <https://play.google.com/store/apps/details?id=com.sap.mobile.travelreport&hl=de>, [15 March 2014].

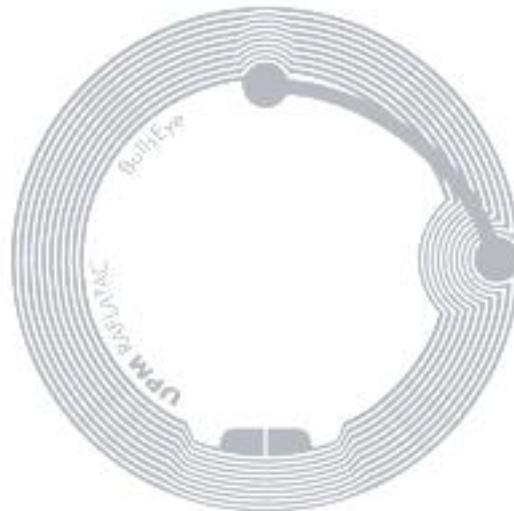


Figure 1. Example of an NFC tag. Diameter is 2,5 cm and the thinness of a DIN A4 paper.
Source: <http://www.rfidshop.com/38mm-label-mifare-ultralightnfc-777-p.asp>

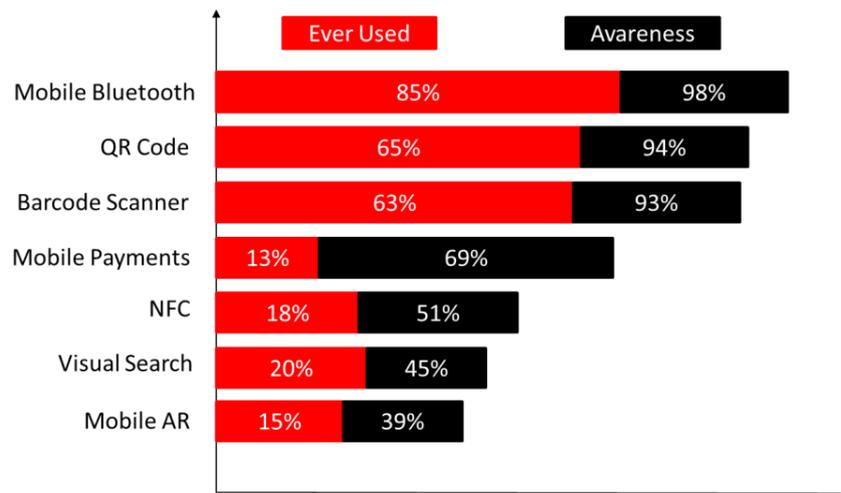


Figure 2. Awareness of NFC technology versus other mobile technologies.
Source: Daily Dooh <http://www.dailydooh.com/archives/65317>

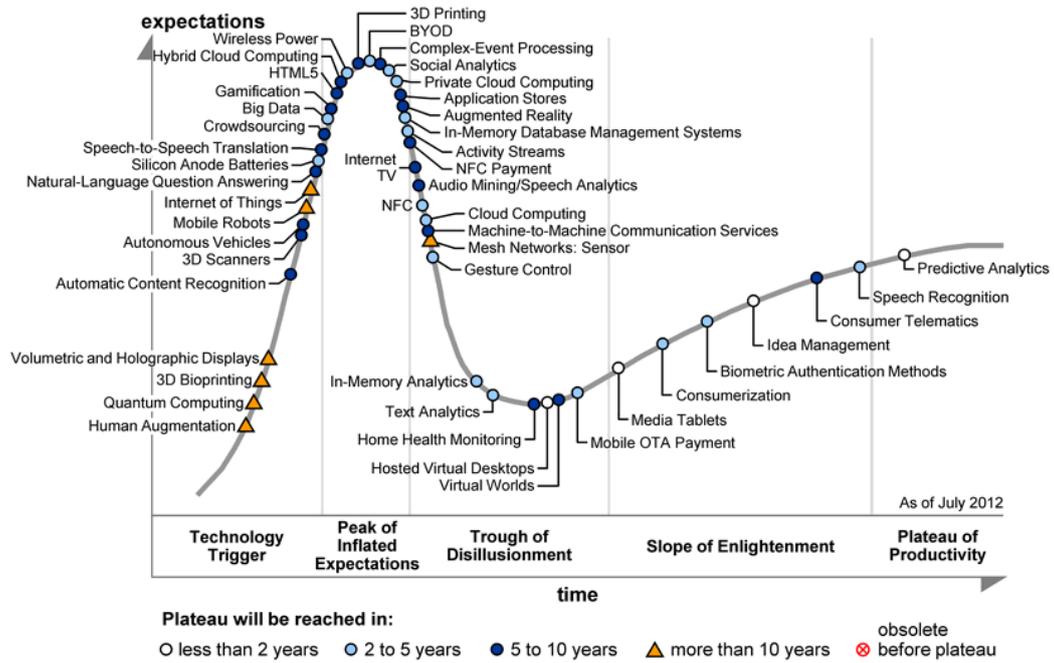


Figure 3. – Hiper-cycle emerging technologies – Gartner 2014.

Source: <http://www.nfcworld.com/2012/08/16/317281/gartner-places-nfc-in-trough-of-disillusionment/>

<p>Streight</p> <ul style="list-style-type: none"> - Two way data communications - Security level hig – encoding system - High recognition speed due WIFI /3G - Hight penetration of mobile devices - Mobile device as an personal item. 	<p>Weakness</p> <ul style="list-style-type: none"> - Various Technical standards - Support and upgrade cost - NFC Infrastructure and service provider - Consumers concerned about security
<p>Opportunities</p> <ul style="list-style-type: none"> - Extended range of applications - Use of cupons and discounts - Co branding and cross marketing 	<p>Threats</p> <ul style="list-style-type: none"> - Credit Card Companies - Dependency on mobile carrier - Shared cost / revenue between companies - Ownership on the Cosumer data

Figure 4. SWOT analysis of NFC technology in Marketing