Bluetooth Low Energy

***NFC** - Contactless*

Extreme-posters

How to improve the Smart-posters interaction and include iPhone.

Intro

Smart-posters use Near Field Communication (NFC) tags embedded on a paper poster, display frames, kiosks bezels, etc. Smart-posters are essentially passive, meaning they do not need any power, and do not have any other connectivity beyond NFC. NFC-enabled smartphones are used to read information from the posters (NFC tags).

Smart-posters offer higher interaction versus their QR counterpart. With QR codes, the user has to launch an app, aim the camera to the QR code, scan or take a picture, and wait for the device to react. The light conditions, elements, age of the poster, etc. may interfere with the user interaction. With NFC, on the other hand, users simply tap on the poster to get the information ("Tap-to-Get") stored on the tag (URLs, coupons, etc.). The information is transferred to the phone instantly, thereby improving the user experience (UX).

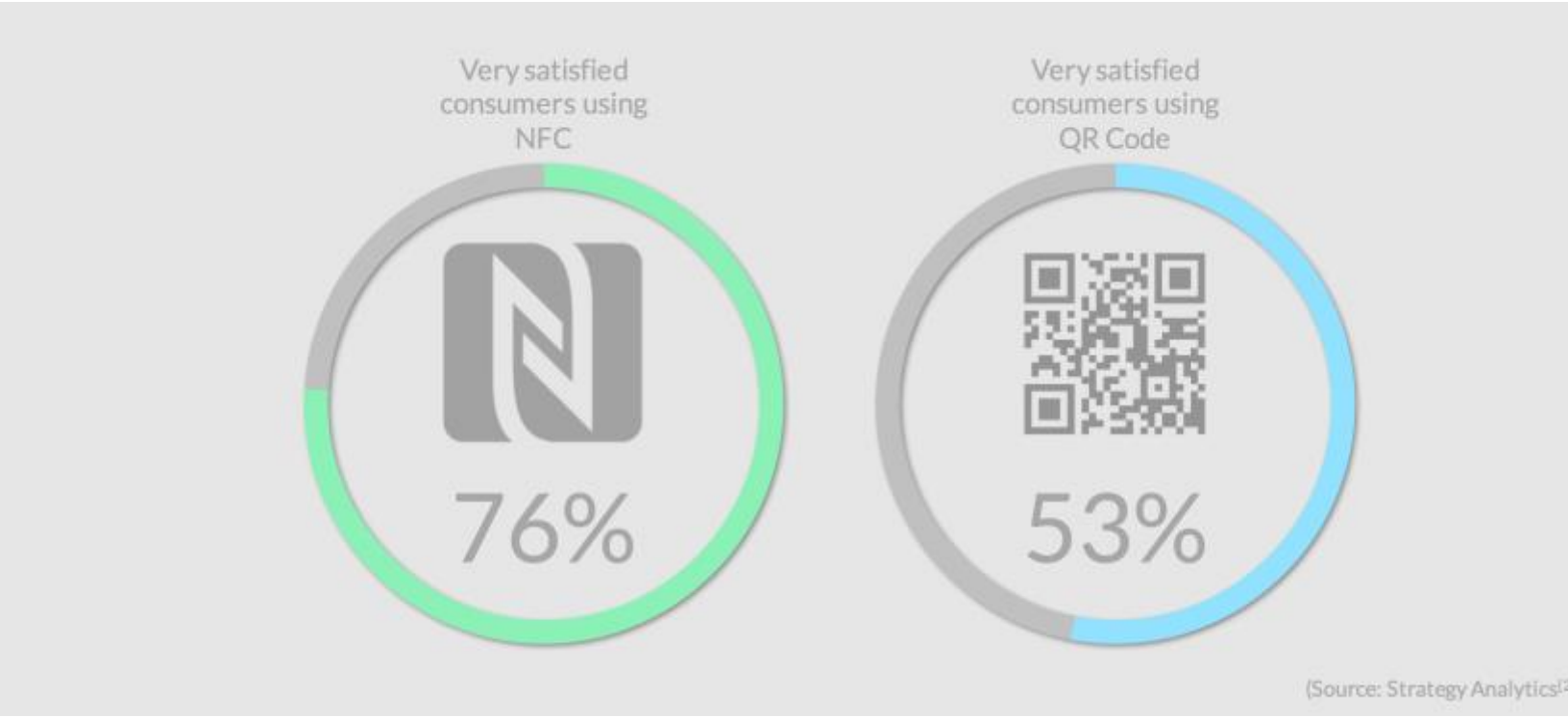
> *"Information with a Twist – the only thing between your message and the audience is an NFC-enabled Smartphone"*
>
> Enlighten Touchpoints.

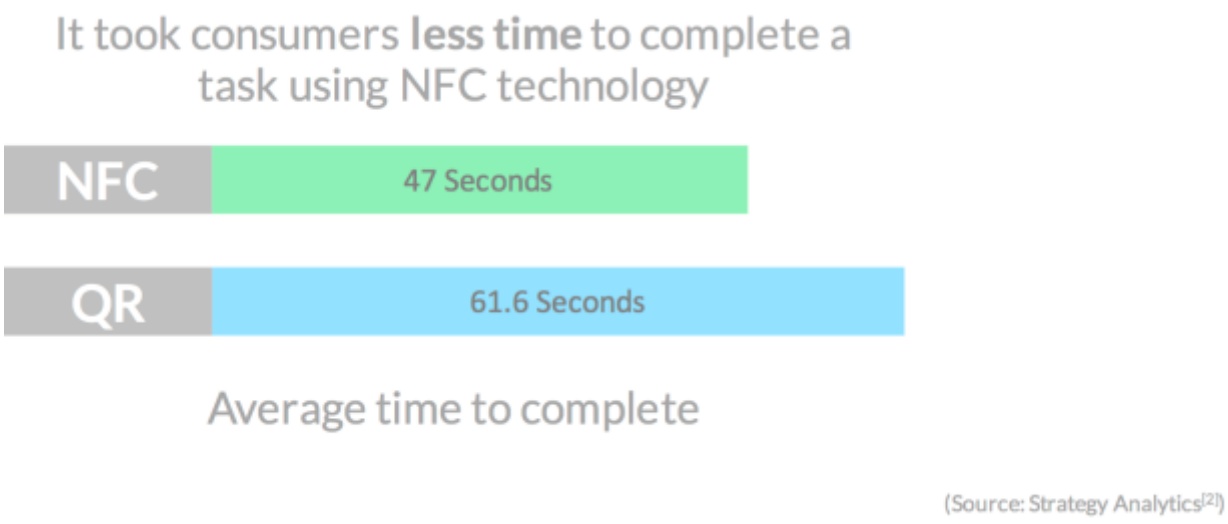
The quote by Enlighten Touchpoint in the insert is partially true. Yes, Smart-posters definitely are "information with a twist". However, there is one more obstacle between the message and the audience: the smartphone, besides being NFC-enabled, "must" support NFC Discovery Mode which is currently limited to Android and Windows Phone mobile devices. Devices that support NFC Discovery Mode have the capabilities to read tags (and hence can read Smart-posters). Unfortunately, NFC-enabled iPhones don't support Discovery Mode and can only emulate NFC tags. This is referred to as Card Emulation Mode. Without Discovery Mode support, the iPhone audience is left outside the "Information with a Twist" statement.

1.9 billion phones

will be NFC-enabled by 2018

(Source: Statistia[1])





Moving Forward

In 2012 the company Xius[3] introduced another twist to the Smart-posters, making them active, and calling them Active-posters. The poster is embedded with an NFC reader (instead of a tag) while the smartphone emulates an NFC tag.

The basic "Tap-to-Get" UX interaction of Active-posters is the same as Smart-posters.

> *"The Smart-poster uses NFC technology in both passive and active mode. The passive mode enables users to read a tag into the handset, giving product information or coupons. The active NFC poster can read information from the handsets and continue to interact with the user - initiate a transaction, download files etc."*
>
> Jeffrey Fraser Sr. Dir. of mCommerce for XIUS.

Active-posters bring a new and improved user interaction by providing more control over the information transferred. In Active-posters, the information can be transferred both ways: upload it to the poster and download to the mobile device ("Tap-to-Transact"). In addition, users can select what information to transfer, digitally sign up, among other things. Users may also interact with Active-posters by using passive tags. Two caveats, however, Active-posters must be powered and still do not include the iPhone share.

All-encompassing Smartphone Presence

iPhone owners remain left out of the interaction in both previous cases. Using Active-posters, smartphones need to emulate tags (Card Emulation Mode), just like Smart-posters. Until the iPhone 6, that behavior was unique to Android devices.

iPhone 6 added support for tag (card) emulation, but only for payment purposes (emulating a contactless credit card), since it was needed for their Apple Pay service.

In 2015, Apple launched iOS 9 and expanded the support of NFC beyond payment to include Apple Wallet passes.

Using the NFC-enabled passes, iPhones can now participate in the Active-poster concept. With the iPhone, the experience must be initiated from the Apple Wallet and then can be passed onto an app. With Android, the experience can start and continue directly from an app.

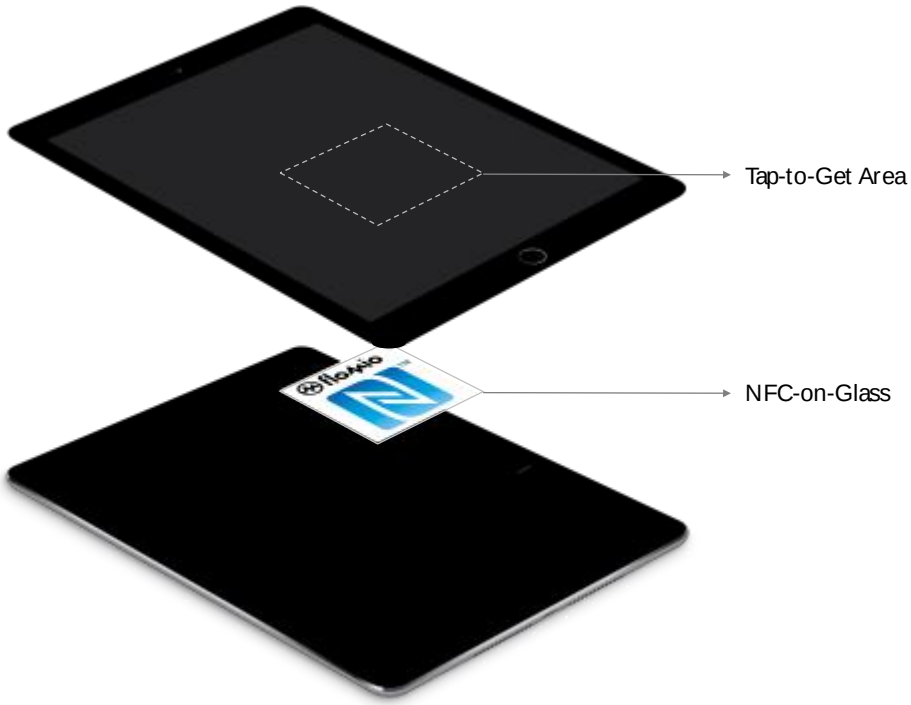
Nevertheless, with the coverage of all smartphone platforms, specifically iPhone, the poster innovation has been redefined, kicking the simplicity of "Tap-to-Get/Tap-to-Transact" experience up a notch. These are the "Extreme-posters".

Extreme-posters

Further improving on the concept of "Information with a Twist", Flomio introduces NFC-on-Glass technology. NFC-on-Glass is what makes "Extreme-posters" simply amazing. It augments iPads and TV screens with "Tap-to-Get" areas within the screen real estate.

Doing so allows advertisers to be more creative with their messaging and capture more engagement. Software applications managing "Extreme-posters" can dynamically guide the user journey using animations, pictures, etc. to heighten the overall experience and

drive more conversions Session management can be animated as well showing, for instance, a successful transaction, extra data needed, indicate errors, and so on. The experience is focused right where it needs to be.
Moreover, multiple "Tap-to-Get" areas can be defined on a single display, with each involving a different type of prompt like signature capture, information exchange, checking in, payment, etc.



How do Extreme-posters behave?

Android and iPhones differ in how they interact with 'Extreme Posters'. Android interactions use the same 'Tap-to-Interact' technology as used with Active Posters and the user experience is the same. - (insert small re-explanation of Tap-to-Interact potentially). While with iPhones, only 'Extreme Posters' can interact with them and the user experience is far superior than that of its Android counterpart. The interaction feels more natural. The user has to simply hold the iPhone (even with screen off) near the "Tap-to-Get" area and the iPhone automatically launches the Apple Wallet with the appropriate pass, without any need to unlock the phone. To confirm the interaction, users need only to authenticate via Touch ID (if required)[4].

How do Extreme-posters exchange information?

NFC tag emulation on iPhone works only on Apple Wallet either as a credit card or a pass[6], "Extreme-posters" can interact with both types independently.
In the case of passes, once the pass is presented, the user taps the phone against the glass (on the "Extreme-poster") and the devices connect. The iPhone then transfers the user's credentials using the Apple Wallet protocol[5] and the communication is established. From then on, the "Extreme-poster" and the phone can start seamlessly exchanging information back and forth.

There are two alternatives to interchange information with the iPhone:

- Direct over Bluetooth
- Over the Internet

Direct over Bluetooth: Using a Bluetooth Low Energy (BLE) NFC reader (for example: http://flomio.com/shop/readers/floble-plus-nfc-reader-for-mobile/), Bluetooth pairing data can be sent over to the mobile device to securely construct a seamless experience. A clever orchestration between iOS app, Wallet pass, and the "Extreme-posters" can establish a BLE PIN-less pairing that appears to "just work". This type of scenario is perfect for "Extreme-poster" that do not have any Internet connectivity.

Over the Internet:

- **Apple Push Notification Service (APNS):** A similar arrangement between "Extreme-posters", iOS app and Wallet pass can be achieved via push notifications. The "Smart-poster" obtains the user ID associated to the app, then the "Extreme-poster" interacts directly with the app via notifications from APNS.
- **In-App Communication:** Another alternative of a similar implementation is the "Extreme Poster" to communication to the App directly using in-app data exchange. This is a preferred method for Android implementations but it can also be used for iOS.

Flomio customizes proximity ID solutions to help enterprise clients and developers cross the chasm to the Internet of Things (IoT). Funded by TechStars, Flomio is fundamentally changing the way people engage with the spaces around them by making proximity ID simple to integrate, easy to deploy, and fun to use. Soon, 50 billion devices will regularly connect to the Internet. The future is ubiquitous frictionless connectivity and Flomio makes sure businesses take advantage of it.

Founded by Richard Grundy, Flomio is headquartered in Miami.

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Sources:

1) Forecast installed base of NFC-enabled phones worldwide from 2013 to 2018 (in millions)
2) NFC technology: How changing consumer preferences create new opportunities for retailers.
3) Active Posters: The physical store front for digital goods
4) Auto-present Passes in Apple Wallet
5) NFC Enabled Passes on Apple Wallet
6) Apple Wallet Pass

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