



mobileFX™

mobileFX Proximity Marketing Guide

<http://www.mobilefx.com>

This **mobileFX** case study is indented to give an in-depth technical coverage on designing, deploying and supporting Proximity Marketing Networks.

- Proximity Marketing is the localized wireless distribution of advertising content associated with a particular place. Transmissions can be received by individuals in that location who wish to receive them and have the necessary equipment to do so.
- Typically, in order to distribute such advertising content, Bluetooth Cells (aka Bluetooth Hotspots) are being used. Currently there are tens of Hardware Manufacturers providing good hardware but only a hand-full providing heavy-duty industrial-class hardware. Deciding the proper hardware is CRUSIAL for the successful deployment of such Networks.
- In the following pages we will try to present to you Proximity Marketing in depth and explain the advantages and disadvantages of this emerging marketing technology.



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What you need to know before deploying a Proximity Marketing Network:

1. First you need to identify an area where consumers and visitors are likely to STAND for a while. Such places can be Bus Stops, Train Stations, Restaurants and Cafeterias, Pubs and Clubs, Vending Machines, Points of Sale, etc. (How much is this “while” depends on content size which is covered in the next pages).
2. Next you need to identify interference-free positions to place your Bluetooth Cells. Any source of electromagnetic interference must be identified and excluded. Typical suspects are Microwave ovens, Professional Loud Speakers, Mixers and Blenders, Sirens, Electromagnetic Rotors and Motors, etc. and WiFi under circumstances (see next chapter). Also, you must place Bluetooth Cells at “chest-level-height”, no more that 2.5 – 3.0 meters of the ground, never place them inside metal boxes (Faraday Cage effect) and if they have omni-directional antennas, take into account the transmission angle of the antenna vs. the installation height.
3. If you need to beat electromagnetic interference you must boost Bluetooth signal with Gain Antennas. Standard Bluetooth Cells emit 0 dbi signal which is usually enough for indoor interference-free installations. However, you much choose industrial-class hardware that can boost this signal up to 5, 7, or even 12 dbi (WiFi standard for outdoor installations). In most EU countries you will need license in order to install gain antennas with transmission power more than 1 dbi. Also, you need to be able to manage your and your customer’s expectations and properly measure if something like that is actually supported by your Bluetooth Hardware. It is quite possible that if your Bluetooth Cells are not designed to support high gains, the boosted signal from each internal radio will develop internal interference among the cell’s radios.
4. Gain Antennas allow transmission to Class 2 mobile phones up to 30-40 meters. Bluetooth emission is divided in 3 power/distance classes. Class 1 is 100 meters, Class 2 is 15 meters and Class 3 is 1 meter. Most consumer-class mobile phones are equipped with Class 2 low-power Bluetooth radio allowing linking up to 15 meters. With Gain Antennas you will be able to serve Class 2 mobile phones in distances grater than 30-40 meters.
5. You need to measure how many Bluetooth Cells you will need depending on the population that visits your installation. Typical Bluetooth cells have 3 radios and each radio has 7 channels. That is $3 \times 7 = 21$ channels per cell; 1 channel out of 21 is usually used for Discovery and the rest for serving content. Each time a new mobile phone is detected, a channel is allocated to this communication; thus most hardware can serve up to 20 mobile phones at the same time. While Bluetooth Cell awaits for a mobile phone to receive or reject the connection, this channel is occupied, typically for 1-2 minutes. If all channels are in wait / transmitting mode, newly discovered mobile phones are queued.

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What you need to know before deploying a Proximity Marketing Network:

6. You need to measure population mobility.
It is vital to measure how long your target population will remain in your Proximity Area and device ways to make them stand until the content is downloaded on their mobile phone.
7. Next you need to inform people about the existence of the Bluetooth area.
Bluetooth signal is invisible and you need to make it “visible” to consumers and visitors. With Digital Signage, Printed and Window Banners or Below Line activities, Roll-ups and Posters, consumers must be called to enable Bluetooth on their mobile phone.
8. OBEX PUSH Opt-In Bluetooth Transmission Request.
Within seconds from detection and if a channel is available, an opt-in message requesting permission for receiving content over Bluetooth appears on the screen of the consumer’s mobile phone. The message is a Bluetooth hardware oriented pairing and handshake request and the only thing that you can parameterize in it is the cell’s name. How the message will appear is different for every mobile phone and it cannot contain any kind of question – only the cells name up to 8 characters (e.g. CocaCola). New Bluetooth Cells allow longer names.
9. If and only if the consumer accepts the transmission in time, the content is downloaded onto his/her mobile phone. Depending on the size of the content, the Bluetooth Radio Class on the mobile phone and Cell’s signal strength, the process usually is completed in a few seconds. However, if consumers do not respond within a timeout (typically 10-30 seconds) the cell frees the channel but the opt-in message on consumer’s mobile phone screen remains; that can miss-lead the user on trying to accept the content while the cell has blocked it.
10. You need to synchronize Bluetooth Cells operating in Zone.
If you allocate several Bluetooth Cells per Campaign then you need to ensure that if a consumer receives content from one of the cells, he will not be poked again by another. This usually means getting the Bluetooth Cells to operate in Zone; all cells within a Zone synchronize by exchanging transmission and discovery information. In many cases synchronization is achieved by “zoning” Bluetooth Cells with Ethernet, WiFi or even GPRS/3G. What is important to know here is that most Bluetooth Cells broadcast UTP packets in order to synchronize and there are many Network Routers that “choke” those packets. Out experience indicates that LINKSYS, CISCO and Vodafone 3G Routers are the most reliable for creating zones.

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What you need to know before deploying a Proximity Marketing Network:

11. You need to monitor logs regularly.
Several Bluetooth Cells have limited memory for preserving logs about successful or failed transmissions. You must include in your campaign process an action for reading the logs and clearing them before they get full and damage your hardware. If applicable, extend your Bluetooth Cell memory with external Flash Memory or set it to log to a Log Server.

NOTE: Another important benefit from regularly monitoring campaign logs is that through the analysis of the logs you will be able very soon to understand if an installation is not efficient. For example, if there are many discovered mobile phones but OBEX transmissions are relatively lower than 20%, it can possibly mean that the Bluetooth Cell is not placed or the campaign not advertised properly.
12. In outdoor installations deploy according to Bluetooth Cell Manufacturer Installation Specifications and use only Industrial-Class Hardware
Beware not to install the Bluetooth Cells in places with excessive Humidity, very hot or very low Temperatures and to read carefully the manufacturer's installation instructions. When placing Bluetooth Cells inside outdoor boxes, make sure those boxes are not metal cages (Faraday Cage effect) and consider placing the RSMA Gain Antennas outside the box.

NOTE: Placing other hardware inside the same outdoor box (e.g. WiFi Hotspots, Network Routers, Hubs and Switches, Power Adaptors, UPS and Power Surge protection devices, etc) might not be advisable because of the accumulative thermal emission and/or electromagnetic interference; check with the manufacturer for RSSI conflicts.
13. How Device Recognition works
In Proximity Marketing it is vital to serve the proper content to the proper mobile phone and this is called Device Recognition. Most modern mobile phones implement Device ID (DID) Profile, a Bluetooth profile where specific device model information is Broadcasted by the mobile phone, making device recognition easier. Unfortunately, older devices do not implement DID and in order to identify their model we use Heuristic Device Recognition Methods. Most common method is sniffing the Bluetooth Friendly Name of the phone and research indicates that 60% of users do not bother changing it. Another and a bit more reliable method is Bluetooth MAC address manufacturer family recognition but no complete databases exist and it is hard to maintain. Usually if a device cannot be successfully recognized and identified we send to this device something called Fall-Back Content. This is fail-safe content that we expect to be compatible with any device.

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What you need to know before deploying a Proximity Marketing Network:

Because both Wi-Fi™ and Bluetooth™ wireless technology share spectrum and will often be located in close physical proximity to one another, there is concern for how they may interfere with one another.

Both Wi-Fi and Bluetooth are inherently resistant to other wireless devices by virtue of their use of spread spectrum techniques, but both fail gracefully in the presence of interference. By this is meant that the communication protocols are very robust and include mechanisms for error checking and correcting, as well as requesting that corrupted packets be resent. Therefore the result of increasing levels of interference is almost always confined to a slowing of the data rate as more packets need to be resent.

Wi-Fi and Bluetooth both occupy a section of the 2.4 GHz ISM band that is 83 MHz-wide. Bluetooth uses Frequency Hopping Spread Spectrum (FHSS) and is allowed to hop between 79 different 1 MHz-wide channels in this band. Wi-Fi uses Direct Sequence Spread Spectrum (DSSS) instead of FHSS. Its carrier does not hop or change frequency and remains centered on one channel that is 22 MHz-wide. While there is room for 11 overlapping channels in this 83 MHz-wide band, there is only room for three non-overlapping channels. Thus there can be no more than three different Wi-Fi networks operating in close proximity to one another. When a Bluetooth radio and a Wi-Fi radio are operating in the same area, the single 22 MHz-wide Wi-Fi channel occupies the same frequency space as 22 of the 79 Bluetooth channels which are 1 MHz wide. When a Bluetooth transmission occurs on a frequency that lies within the frequency space occupied by a simultaneous Wi-Fi transmission, some level of interference can occur, depending on the strength of each signal.



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What you need to know before deploying a Proximity Marketing Network:

▶ Bluetooth Hops Away and Tries Again:

When a Bluetooth device encounters interference on a channel, it deals with the problem by hopping to the next channel and trying again. In this manner it can attempt to avoid interference from a Wi-Fi network. When transmitting data on Asynchronous Connection-Less (ACL) links, the result will be a degradation of data throughput. **However, when using Synchronous Connection Oriented (SCO) links to transmit time-sensitive information such as voice, packets can be lost because these links do not utilize Automatic Repeat Request (ARQ).**

▶ Wi-Fi Slows Down and Tries Again:

Wi-Fi acts like a wireless Ethernet™, and it deals with interference like Ethernet does. If a transmission fails it assumes that a collision has occurred due to two stations trying to transmit simultaneously, and an ARQ is issued. In addition, many installations of 802.11b utilize the optional automatic data rate modification feature. This allows the data rate to fall back from 11 Mbps to 5.5, 2, or even 1 Mbps, in an effort to lower the Bit Error Rate (BER) due to poor signal-to-noise ratio (SNR). In this scenario, if a Wi-Fi device encounters interference from a Bluetooth transmission and subsequently slows its transmission rate, it will then spend more time than before transmitting a packet on a frequency available to Bluetooth, thus having the effect of increasing the likelihood of interference between the two. **Data is not lost, but the data throughput rate may slow to an intolerable level.**



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What you need to know before deploying a Proximity Marketing Network:

Efforts to Ensure Bluetooth and Wi-Fi Coexistence

The Bluetooth SIG and the IEEE 802.15 working group are collaborating on efforts to define mechanisms and recommended practices to ensure the coexistence of Bluetooth and Wi-Fi networks. Coexistence is defined¹ as “the ability of one system to perform a task in a given shared environment where other systems may or may not be using the same set of rules”. These practices fall into two categories:

1. Collaborative mechanisms

- A collaborative coexistence mechanism is defined as one in which the wireless personal area network (WPAN™) and the WLAN communicate and collaborate to minimize mutual interference. The following collaborative techniques being considered require that a Wi-Fi device and a Bluetooth device be collocated (i.e. located in the same laptop).
- TDMA (Time Division Multiple Access) techniques 2,3 allow Wi-Fi and Bluetooth to alternate transmissions. Bluetooth can support piconets, but cannot support SCO links.
- MEHTA22 (the Hebrew word for “Conductor”) is a technique for managing packet transmission requests. It grants permission to transmit a packet based on parameters including signal strength and the difference between 802.11 and Bluetooth center frequencies. It can support SCO links.
- Deterministic frequency nulling⁴ is a mechanism used in conjunction with MEHTA that inserts a 1 MHz-wide null in the 22 MHz-wide 802.11 carrier that coincides with the current Bluetooth center frequency.

2. Non-collaborative mechanisms

- A non-collaborative coexistence mechanism is one in which there is no method for the WPAN™ and WLAN to communicate. Non-collaborative techniques being investigated are:
 - Adaptive packet selection and scheduling⁵ is a Bluetooth Media Access Control (MAC) level
 - Enhancement that utilizes a frequency usage table to store statistics on channels that encounter interference. This table can subsequently be accessed by packet scheduling algorithms that schedule transmissions to occur only when a hop to a good channel is made.
 - Adaptive frequency hopping⁶ classifies channels and alters the regular hopping sequence to avoid channels with the most interference.



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Bluetooth

Bluetooth Profile is a wireless interface specification for Bluetooth-based communication between devices. In order to use Bluetooth technology, a device must be compatible with the subset of Bluetooth profiles necessary to use the desired services. The way a device uses Bluetooth technology depends on its profile capabilities. The profiles provide standards which manufacturers follow to allow devices to use Bluetooth in the intended manner. At a minimum, each profile specification contains information on the following topics: a) dependencies on other profiles b) suggested user interface formats and c) specific parts of the Bluetooth Protocol Stack used by the profile. To perform its task, each profile uses particular options and parameters at each layer of the stack. This may include an outline of the required service record, if appropriate.

Bluetooth Protocol Stack is a particular software implementation of a Bluetooth networking protocol and profiles suite. The terms are often used interchangeably. Strictly speaking, the suite is the definition of the protocols, and the stack is the software implementation of them. Individual protocols within a suite are often designed with a single purpose in mind. This modularization makes design and evaluation easier. Because each protocol module usually communicates with two others, they are commonly imagined as layers in a stack of protocols. The lowest protocol always deals with "low-level", physical interaction of the hardware. Every higher layer adds more features. User applications usually deal only with the topmost layers. In practical implementation, protocol stacks are often divided into three major sections: media, transport, and applications.

▶ Object Push Profile (OPP)

A basic profile for sending "objects" such as pictures, virtual business cards, or appointment details. It is called push because the transfers are always instigated by the sender (client), not the receiver (server). OPP uses the APIs of OBEX profile and the OBEX operations which are used in OPP are connect, disconnect, put, get and abort. By using these APIs the OPP layer will reside over OBEX and hence follow the specifications of the Bluetooth stack.

▶ Serial Port Profile (SPP)

This profile is based on the ETSI TS 07.10 specification and uses the RFCOMM protocol. It emulates a serial cable to provide a simply implemented wireless replacement for existing RS-232 based serial communications applications, including familiar control signals. It provides the basis for DUN, FAX, HSP and AVRCP profiles.

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Depending on Content delivered and User Interaction with it, Proximity Marketing Campaigns are organized in four groups:

1. OBEX PUSH Campaigns

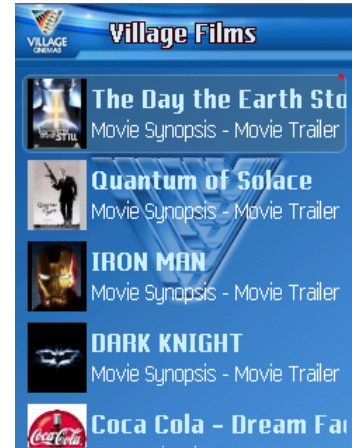
This is the simplest form of Proximity Marketing when a Bluetooth Cell broadcasts a single file (image / video (3gp/mp4/divx) / audio (amr/wav/mp3/midi) / Java / Flash Lite / VNote / VCard / etc) to a mobile phone.

▶ Those campaigns are compatible with ALL Bluetooth-enabled mobile phones except: iPhone and BlackBerry which are locked, and SAMSUNG devices that even though they accept any content, they do not allow running Java files fetched over Bluetooth. Another typical problem with OBEX PUSH is when sending images where you need to identify the screen size of the mobile phone and send it the appropriate-sized image. Most Bluetooth cells can be configured to perform this decision.

2. OBEX PULL Campaigns

With OBEX PULL campaigns users can request (pull) different content from the Bluetooth cell. Typically a Java On Device Portal (ODP) is first pushed to the mobile phone with OBEX PUSH (previous method); the ODP displays a Content-Menu from which the user can choose the additional content to download on his/her mobile phone. In the Village Films example on the right, the ODP displays a list of movies and by choosing a movie the user can download the Video Trailer on his mobile phone for free from the Bluetooth Cell.

▶ This method is compatible with any mobile phone allowing Bluetooth transmission of Text Files over the OBEX protocol; that is almost all of them. HOWEVER: the Java ODP Content Menu method which significantly simplifies content request is compatible only with a limited set of mobile devices such as NOKIA, Sony Ericsson and BenQ Siemens that allow programmatic control of the Bluetooth stack of the mobile phone from a Java Program (J2ME / MIDP2.x / CLDC 1.x / JSR 82). Devices like SAMSUNG, LG, Motorola and others ARE NOT compatible with OBEX PULL using a Java ODP and tedious text files must be used.



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Depending on Content delivered and User Interaction with it, Proximity Marketing Campaigns are organized in four groups:

3. SPP Semi-Dynamic Content Campaigns

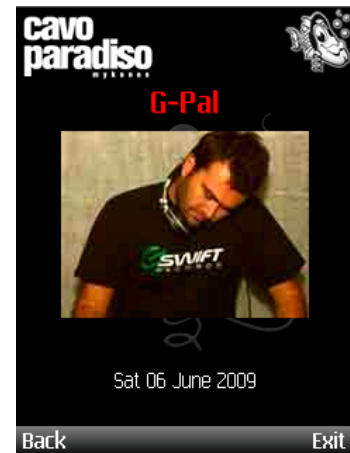
Imagine a case where you need to serve the product catalogue of a store like Argos or IKEA. Each of those product catalogues have over 1000 pages of thousands of products; designing a PDF, or a Flash Lite application, or a Java ODP would be practically impossible to transmit over Bluetooth because of its excessive size. In that case you need to design a Java ODP Browser capable of downloading on request over Bluetooth and displaying a single product Page at a time. Such campaigns where large quantities of content are served on-demand as pages within the ODP application are called SPP Semi-Dynamic Content Campaigns because even though content is static, it is downloaded on-demand on the mobile phone at part of the ODP and not as an additional monolithic file (vs. OBEX PULL)

4. SPP Fully-Dynamic Content Campaigns

This is similar to Semi-Dynamic Content Campaigns but in this case we need to serve Real-Time Flight Information over Bluetooth; in other words, we need to serve at real-time raw data of information. Again, for doing so the best and appropriate method is with a Java ODP Browser application.

▶ SPP means Serial Port Profile and is a Bluetooth Profile that allows opening a Full-Duplex Communication Channel between the mobile phone and the Bluetooth cell. Through that channel, the mobile phone and the Bluetooth cell exchange raw information and data. It is possible to wrap those SPP packets in TCP/IP packets and route them directly to a Web Server over HTTP or to an Application Server over Sockets; this wrapping protocol is called SPP over IP (SPPoIP) and it is the cornerstone of FREE data and information transmissions over Bluetooth technology.

▶ The SPP methods are compatible only with a limited set of mobile devices such as NOKIA, Sony Ericsson and BenQ Siemens that allow programmatic control of the Bluetooth stack of the mobile phone from a Java Program (J2ME / MIDP2.x / CLDC 1.x / JSR 82). Devices like SAMSUNG, LG, Motorola and others ARE NOT compatible.



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On Device Portals (ODP)

- **On Device Portals (ODP)** are Interactive Applications, typically implemented in cross-platform programming languages such as Java Micro Edition (J2ME).
- **On Device Portals (ODP)** are the ultimate Brand Awareness tool as they place the Brand Logo on the Menu of the consumer's mobile phone.
- A **Branded ODP Application** is sent directly to consumer's mobile phone completely for FREE via Bluetooth, or with a traditional WAP PUSH SMS (but download charges apply).
- Through ODPs, a Brand may decouple its Mobile Services from Network Operators by offering to its consumers **Independent brand-specific VAS** – a privilege held until recently only by Network Operators.
- An ODP may contain its holders **Unique Digital Customer ID**. This way, services such as **Mobile Commerce, Mobile Tickets & Coupons** and **Award & Loyalty Programs** can be implemented within a single application enabling **Mobile Payments** and product purchases through Mobile Wallet or Mobile VISA Payments.
- Bluetooth-enabled ODPs can present **Real-Time Information** and **Entertainment** for FREE!



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On Device Portals (ODP)

- Vast array of **Value Added Services** embedded inside a single deliverable of small size.
- **Geo-Sensitive Content** that is automatically updated depending on the visiting Country / Region / City and cached as static content.
- **High Degree of Flexibility**, easy-to-integrate with 3rd party systems. (e.g. Weather Forecasts, RSS Feeds, Tourist Services, City Services, etc)
- **Bi-directional Communication Channel** between the company and each customer individually – ideal for Marketing Research.
- **Automatic Updates** over-the-air (OTA) for future releases, Marketing Promotions and Competitions, and system scalability / expandability.
- **Efficiency**, no more printed receipts that can be forgotten at home, lost, or fill-up the wallet.
- **High Degree of Customer Acceptance** (Gadget-like innovative nature)
- **Low Costs and High Benefits.**



Social Networking



Transportation Information



Entertainment Guide



General Information



Hotels & Accommodation



Tourist Guide



Restaurants



Emergency Information

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On Device Portals – Disadvantages!

- They run only on newer “resourceful” mobile phones (devices released after Q2 2004).
- They require longer development time than WAP Portals (* alleged)
- They require On-Device testing to ensure compatibility (* alleged)
- They might depend on APIs that are not available on every mobile phone (e.g. Location-based Services).



Proximity Marketing – Disadvantages!

- Somehow, consumers must be informed to turn-on the Bluetooth on their mobile phone; thus it is a complementary marketing method for in-store marketing and out-and-about marketing, delivering mobile advertising and VAS. It is yet another channel.
- Limited by short broadcast range depending on mobile phone radio (20 - 50 meters radius).
- Device recognition is based on Heuristics (e.g. mobile friendly name) since only new devices implement Device ID Profiles (DID).
- Bad use of Technology can result into spamming.
- Media emphasize on technology misuse (e.g. viruses over Bluetooth) rather than its marketing value; thus consumers are skeptic.
- Many Device Manufacturers did not allow devices to receive free interactive content (i-Phone, BlackBerry, Samsung).

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The “mobileFX Offering”!

We enable you to
“Create & Deliver VAS
over Proximity Marketing”



mobileFX™ Studio – A tool to Create VALUE!

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The screenshot displays the mobileFX Studio IDE interface. On the left, the **Project Explorer** shows a tree view of the project structure, including folders like 'Project [Skylines]', 'ODP (13)', and various service-related folders. Below it, the **Properties** window is open, showing details for the 'Main' page, such as Name, Display Name, Icon, and Version. The main workspace is the **Page Designer**, which shows a visual representation of a mobile application page with a 'Main Menu' containing items like 'mTicket', 'mCheckin', 'mBoarding', 'Services', 'Miles & Bonus', and 'City Guide'. The **ODP Theme Composer** is also visible on the right side of the workspace. At the bottom, the **Output Window** displays system logs, including bytecodes executed, thread switches, and garbage collection statistics.

The IDE has WYSIWYG Designers for any Project Element:

- ODP Page Editor
- Pixel Editor (Images)
- Animations Editor
- TiledLayer Editor
- Custom Font Editor
- Localization Editor
- Sound Editor and Converter
- Ringtone Editor
- Sprite Modeler
- Video Converters
- (many more)

Project Explorer and the Properties Window are the most important IDE managers.

- Plugins Manager...
- Sounds Editor...
- Mobile Video Converter...
- XML to Datastream Converter...
- Instant Win Codes Generator...
- DataMatrix Barcode Generator...

- mobileFX SMSGate Server
- mobileFX Bluetooth Spy
- mobileFX BlueGate Server
- mobileFX SPPoIP ODP Server
- mobileFX SignGate Server

- Publish Project...
- OBEX to Device...
- NOKIA Application Installer
- SONY Ericsson Installer

The IDE offers literally hundreds of Tools, Plug-ins, Filters and Utilities for getting the job done as fast as possible.

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What you may develop with mobileFX Studio:

On Device Portals

On Device Portals (ODP) are Marketing Applications consisting of Pages. Navigation among the pages of an ODP is very similar to browsing a web site with Hyperlinks and Intuitive Navigation Logic. Also, there is a vast array of Controls and Widgets that can assist you on developing elegant applications.



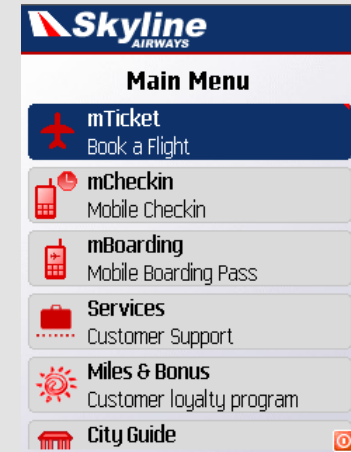
Mobile Advergames

With mobileFX Studio you can very easily create 2D Scrolling Platform Games and Advergames by just designing the Graphics for your Sprites and the TiledLayers of the Stages.



Mobile Applications

The IDE offers innovative features for developing more sophisticated applications as well, such as Mobile Loyalty Cards, Mobile Commerce Apps, Mobile Banking and Automation Applications.



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Why this IDE is good for:

Rapid Prototyping

- You can develop any desired application fast and ideally without any programming at all.
- You can Clone and Rebrand an existing Application within minutes.
- Concept Demos for customers can be produced with minimal effort.

Deployment

- You can deploy an Application directly to VAS Stores (e.g. NOKIA OVI), Content Publishers and Proximity Marketing Networks.
- You may run Applications in standard WTK Emulators (Sun WTK, Sony Ericsson, NOKIA).
- You can perform On Device Debug (ODD).
- You may deploy an Application OTA.

Integration

It is extremely easy to develop Applications that integrate seamlessly with all mobileFX Server Products, such as:

- mobileFX™ SMS Gate
- mobileFX™ BlueGate
- mobileFX™ ODP Server
- mobileFX™ SignGate

User Friendly

- The program requires only BASIC web design knowledge and it is designed so that any web developer or graphics artist can use it.
- The User Interface is Intuitive with lots of Context-specific Popup Menus and clever designers.
- It has tens of Editors, Wizards and Plug-ins that will do most of the work for you.

A-Z Feature set

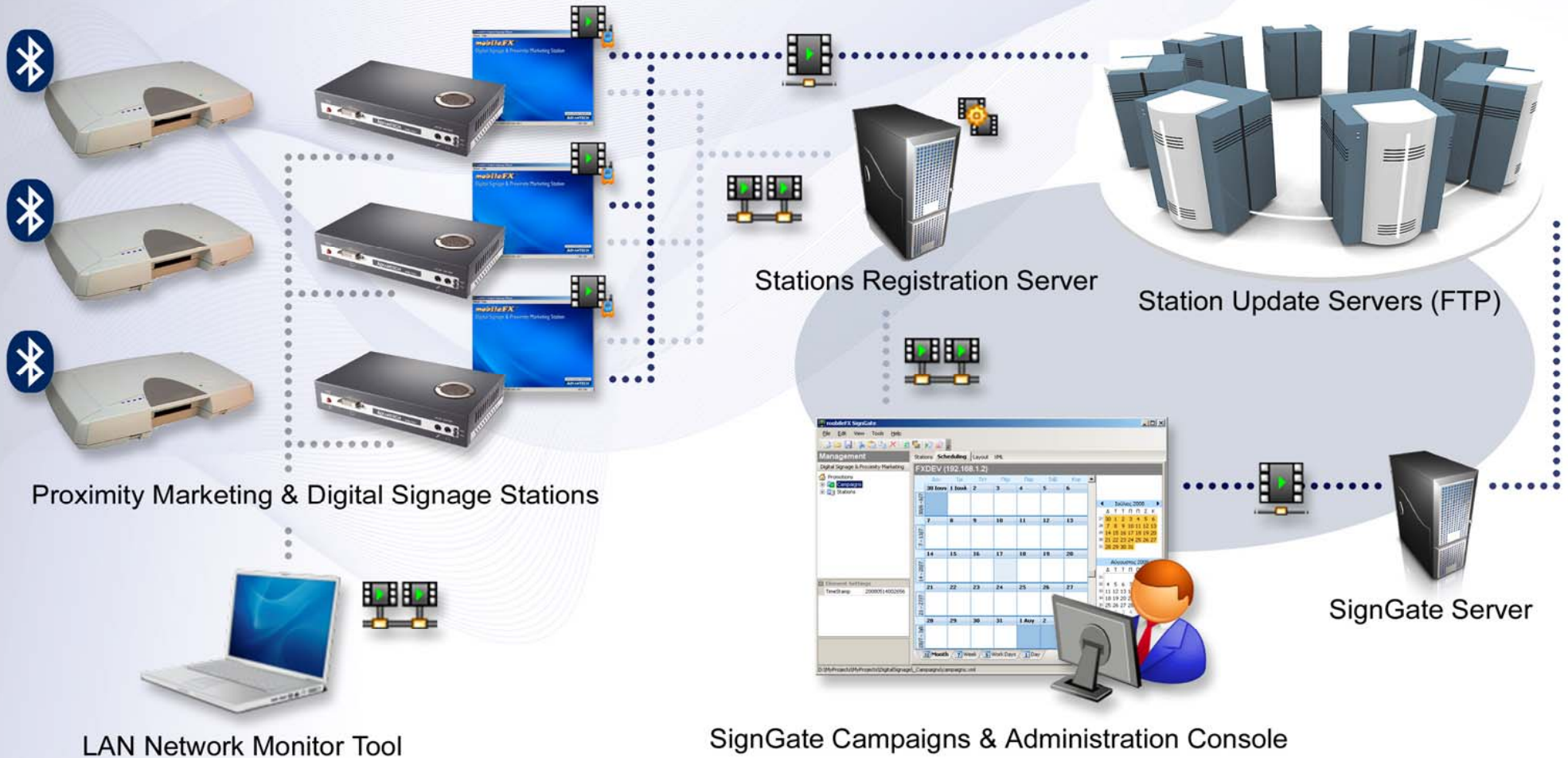
- All common Mobile Marketing features are already included in the basic feature-set.
- **Age Verification**
- Instant Win
- 2D Mobile Coupons (DataMatrix)
- Sending SMS / Premium SMS
- It is a live project – features are added as we speak.

Cost Effective

- A single person can conceive, design, prototype and develop a Mobile Marketing or Proximity Marketing campaign.
- Ideal for Development Teams with Visual Source Safe integration.

Interactive Proximity Marketing & Digital Signage Networks

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Interactive Digital Signage Plugins



POS (TCP/IP)



Touch Screens



Bluetooth Cells (SPPoIP)



RS232 / USB Devices



Barcode Readers



Light Guns



Game Joysticks



GSM Modems

Contact

<http://www.mobilefx.com>

mobileFX Studio

52 Electras str,
Kallithea 17673,
Athens – Greece.
Tel. +30 210 9522504
Fax. +30 210 9522596

Contact Details:
Elias G. Politakis

email: epolitakis@mobilefx.com

URL: <https://www.mobilefx.com>