



**“Open-Source, Web-Based, Framework for Integrating Applications with  
Social Media Services and Personal Cloudlets”**

**WP6 Task 6.2 Milestone 1  
Personalized Advertising**

**Work Package:** WP6 – Prototyping & Use Case Evaluation

**Authors:** Timotheos Kastrinogiannis (VELTI),

**Status:** Draft

**Date:** 17/03/2014

**Version:** 0.1

**Classification:** RE

**Disclaimer:**

The OPENi project is co-funded by the European Commission under the 7<sup>th</sup> Framework Programme. This document reflects only authors' views. EC is not liable for any use that may be done of the information contained therein.

## Table of Contents

“Open-Source, Web-Based, Framework for Integrating Applications with .... Social Media Services and Personal Cloudlets” .....	1
<b>WP6 Task 6.2 Milestone 1</b> .....	<b>1</b>
<b>Personalized Advertising</b> .....	<b>1</b>
<b>Table of Contents</b> .....	<b>2</b>
<b>1 Task and Demo Application Goals Overview.</b> .....	<b>3</b>
1.1 WP Task6.2 Goals .....	3
1.2 Envisioned application(s) expected functionality and key features.....	3
1.3 Application’s Ecosystem (Roles Description and Operations) .....	8
1.4 Initial Application Map (in terms of key basic UX/UI pages and sections)..	9
<b>2 Tasks 6.2 Applications’ Features Mapping to Corresponding Use Case (as described in D2.4)</b> .....	<b>10</b>
2.1 Please justify how the envisioned application features are related to the corresponding WP2 use cases (Please provide covering %). .....	10
2.2 Please specify WP5 SE that will be used and their corresponding role.....	11
<b>3 Task6.2 Components-Based Effort Allocation</b> .....	<b>12</b>
3.1 Please specify the key features/tasks of the app(s) that will be implemented in your task and the corresponding partners that will be involved. (e.g., UI/UX design (VELTI), SE Integration (VELTI); .....	12
3.2 Please verify and report on Task Partners interests, given current project evolution. ....	12

# 1 Task and Demo Application Goals Overview.

---

## 1.1 WP Task6.2 Goals

In line with OPENi DoW, Task 6.2 namely “Personalised Advertising Prototype” aims at the creation of an OPENi enabled **prototype application (TR1)** that will use the information stored in users personal Cloudlets in order to **provide cross-channel personalized ad services in an opt-in and anonymised basis (TR2)**. The overall demo should make use of the enhanced security and **controlled data access of the user’s data (TR3) in order to anonymously and non-invasively provide context based personalized advertising (pull model) (TR4) and marketing (push model)** where the users can be **encouraged to opt-in to a marketing program via incentives like offers, coupons (TR5)** e.t.c.

The above description reveals five main “Task Requirements” (**TR**) that need to be accomplished along with the overall WP6 goals (**G**) applied also to this task, which are:

- I. **(G.I)** To define application’s features correlated to the corresponding Use Case (as detailed in D2.4);
- II. **(G.II)** To prioritize the latter application features with respect to:
  - Demonstrator/Trial feasibility (Minimum Viable Applications);
  - Effort required;
  - Dependences (with other tasks);
- III. **(G.III)** To design and implement usability trials towards evaluating:
  - I. Application’s design innovation
  - II. Application’s innovative features
  - III. Cross-platform enabled features
- IV. **(G.IV)** To produce consolidated reports to feed WP4 and WP5.

The latter four goals (G) along with the corresponding task level requirements (TR) constitute the main agenda and drivers of Task 6.2.

## 1.2 Envisioned application(s) expected functionality and key features

In this section serves a twofold goal. First it aims at analysing existing landscape in mobile marketing and advertising and highlights upcoming and future needs. Motivated by the latter, a high level description of the envisioned application is provided and the role of OPENi technologies (Cloudlet and API Platform) towards enabling the latter is justified.

### 1.2.1 Mobile Applications Landscape & Future Apps Requirements.

The high penetration of smartphone devices during the past ten years has led to an increased adoption and use of native mobile applications in the majority of end-mobile-users’ daily-life activities.

The increased popularity and diversity of mobile native applications can be further verified via observing the current growth ratio of the two most popular application stores. Apple's iOS app store is growing by almost 20,000 apps per day while recently reached the 40 billion download mark. Android reports that users download more than 1.5 billion apps and games from Google Play each month.

Following such a rapidly evolving trend, the design and features of mobile applications have been further evolved during past years, aiming at the optimization of overall quality of end-users' (app consumers) experience. The initially dominating device-centric applications design/development model, where the majority of the features of an app were performed locally at user's mobile devices or where supported via a thin custom back-end, gave its place to a social-centric model triggered by social networks expansion. In this model, mobile applications are integrated with social networks (via globally exposed APIs by the latter, e.g., FB Graph API) towards supporting a large variety of features, from basic log-in and social interactions (e.g., like and invite) to more complex ones (e.g., users score in a game). To enable the latter, low storage/componential operations are required to be performed by the corresponding social networks cloud based services (CBS) back-end.

The current wave of mobile application design and development is motivated by the explosion of CBS and APIs technology, offering a variety of cloud based services from simple dedicated ones (e.g., photo albums (e.g., Instagram), health measurements (e.g., Runkeeper), tracking/analytics (e.g., Flurry), online maps (e.g., Google Maps), e.t.c.) to more complex general-purpose Cloud services, offering enhanced storage, computational/processing and communication options (e.g., like Parse and Firebase) or CDNs (e.g., Akamai). Nevertheless, existing limitations imposed by the CBS capabilities and supported KPIs, in terms of scalability, expandability, geographic multiplicity, storage as well as corresponding cost, limits their exploitation and wider adoption by application developers.

In line with the previous analysis two emerging needs are revealed:

A. From **native application developers' point of view**, the need of using and exploiting advance cloud technologies towards facilitating their apps with enhanced features that will advance end-users experience in a personalised manner.

Such future native applications features are:

- 1) The distribution of large amounts of digital content/data among various geographies via a native mobile application, obeying personalized content delivery criteria based on current end-users' context, interests and needs.
- 2) The storage of application users' personal, profile, social and contextual data in the Cloud (in a secure and privacy aware manner e.g., personal user-centric Cloud spaces) towards enabling personalized and context-aware application features.
- 3) The integration of a mobile application with multiple and various Cloud Based Services (CBS) such as , Social Networks (e.g., Facebook, Tweeter) for providing social features, Content Providers (e.g., Youtube) for in-app content delivery, Mobile Advertising Networks (e.g., Mobile Ad Servers and Push Notification Platforms) for supporting in-app advertising, e.t.c.

B. From **end-user point of view**, the need for efficiently identifying native application (from the vast amount of existing apps) that will serve their current needs either long-terms (e.g., a health or finance app) or short-term needs (e.g., a city tour app). Existing marketplaces silo-based search and distribution of native mobile application, created the end-users need for a flexible search and personalised recommendations of mobile apps.

*Motivated by the latter needs the envisioned Task6.2 application will enable all the above features via exploiting OPENi technology Cloudlet and API Platform, towards enabling a prototype application that will fulfil and demonstrate the latter features of the new era of native applications.*

### 1.2.2 Cross-Channel Optimization and Personalization in Future Mobile Marketing and Advertising

Current widely adopted (state-of-the-art) methodologies and techniques in Mobile Marketing and Advertising are highly affected and driven by the rapid evolution of a) mobile devices technology (i.e., smartphones global penetration with enhanced computational/storage and internet connectivity capabilities), b) wireless access networks (WiFi, 3G/4G) and rich media technologies (e.g., HTML5) and c) native application developers evolving communities (mainly driven by three application stores i.e., Google Play (Android), Windows Store and Apple Store (iOS)). As a consequence, key factors that affect and determine the success of a marketing campaign such as end-users/customers overall experience and campaign's performance optimization (e.g., tangible ROI), have not yet been sufficiently addressed.

The new emerging era of mobile Marketing and Advertising will be characterized by **personalization and audience targeting** towards enabling enhanced end-user's experiences and providing **added value to the consumers**.

C. From **mobile marketers and advertisers'** point of view, an emerging need is revealed of realizing personalized marketing campaigns that take into consideration various user activities, from preferences and geo-location attributes to behavioral data and social interactions, towards addressing/targeting population segments with specific characteristics, instead of bulk audiences without any previous knowledge of their preferences.

An ideal behavioral targeting model should enable advertising agencies to combine data (billions of users across multiple geographies/countries) offered by various sources/channels for delivering ads that are relevant to the intended targeted market segment, at a scheduling which is convenient (and not intrusive) and using the channel which is more appealing to them (e.g., SMS, email, Native Apps Banner Ads, Push Notifications, e.t.c.).

*Driven by the above future mobile marketing and advertising vision, Task6.2 application will enable **advanced personalization and audience targeting in mobile marketing** via exploiting OPENi enabled Service Enablers: Timeline SE, Advertising SE, Recommendations SE and Analytics SE.*

### 1.2.3 Task 6.2 Application High Level Description and Key Features.

Motivated by the latter needs (A, B and C) concerning a) future mobile applications ecosystem as well as the b) emerging mobile marketing and advertising era, Task 6.2 envisions the creation of an innovative application that will address and demonstrate the latter via efficiently exploiting the unique features of OPENi Cloudlet and API Platform.

“OPENi applications **Recommender** and **personalised Ads**” native application and corresponding ecosystem, namely **OPERA**. The users of **OPERA** application will be able to:

- A. (AP\_1) Search, discover and download** OPENi-enabled mobile applications, as well as mobile content (e.g. video).
- B. (AP\_2) Get personalised recommendations** for OPENi-enabled applications based on their profile, interests, current needs and context (stored in their Cloudlet).
- C. (AP\_3) Be served with cross-channel personalised ads** in OPERA application based on their digital and social life context and preference, via multiple channels such as push notifications, in app rich media ads and emails;
- D. (AP\_4) Visualize** the use of their OPENi-application, recommendations and received ads history **over time, with respect to their corresponding interest and context.**
- E. (AP\_5) Get anonymously and non-invasively provide context based** personalised and targeted ads, via OPENi-enabled application(s).
- F. (AP\_6) Collect points and get rewarded** from their actions in the latter apps (e.g., for reaching a game level) or the ads in the content (e.g., for clicking a banner ad overlay in a video), via participating in an **interactive games** (i.e., a loyalty real-file game);
- G. (AP\_7) Store** their digital data, digital context and footprint in the Cloudlet (managed by the application) and **control the privacy** of the latter in a secure and EU legislation and policies aware manner.
- H. (AP\_8) Control** the **provided cross-channel personalized ad services in an opt in and anonymised** basis via OPENi enhanced Permission Visualization and Auditing features.
- I. (AP\_9) Interact with social and context aware experiences** generated via the application in a dynamic personalized way, by exploiting the features of the powerful OPENi API platform and the corresponding integration with multiple CBS.

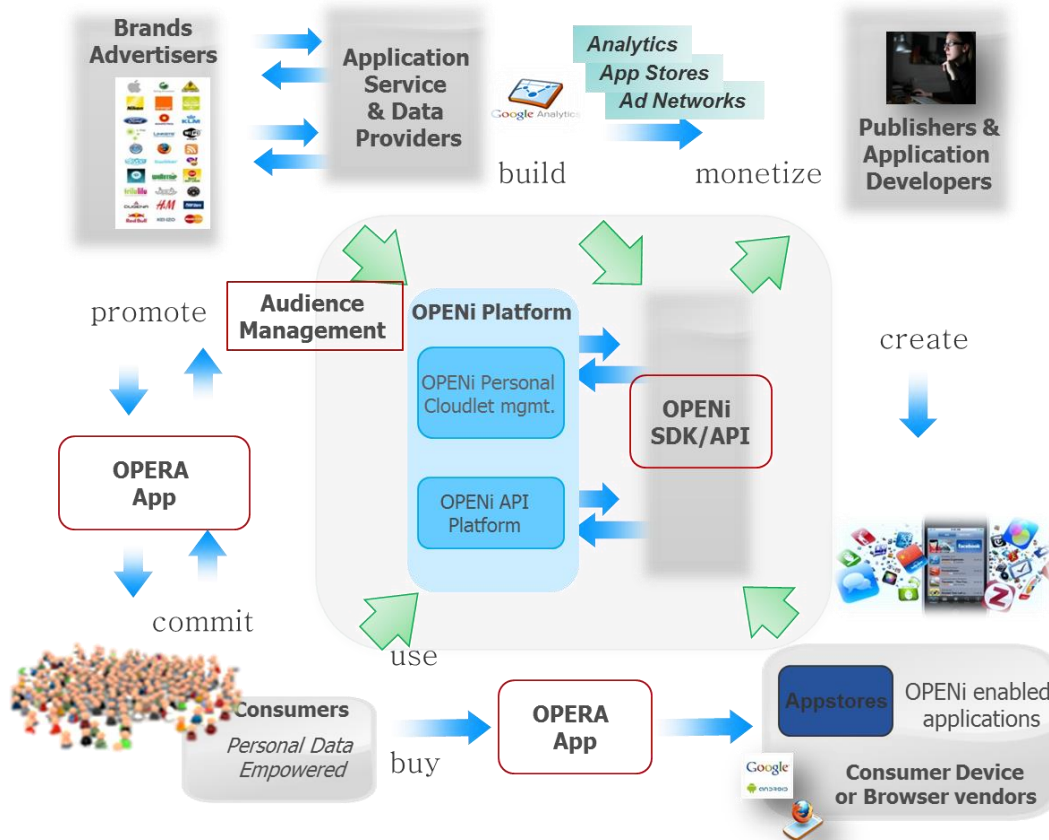
The following table details and justifies how the above nine key features of OPERA application a) address the needs of future mobile applications ecosystem as well as the emerging mobile marketing and advertising era, as detailed in section 1.2, b) fulfil the requirements of this task (TR), as detailed in section 1.1, and finally the indicated the components of OPENi platform that will be used towards enabling them.

**Table 1 OPERA Application Features Justification**

<b>Application Feature</b>	<b>Feature Description</b>	<b>Needs Addressed</b>	<b>Task Feature Addressed</b>	<b>Partner</b>
<b>AP_1</b>	OPENi Enabled Apps Search, Discovery and Access	B	TR1	WIT, VELTI
<b>AP_2</b>	Personalised Apps Recommendations	B	TR1, TR3	VELTI
<b>AP_3</b>	Cross Channel Personalised Ads	B, C	TR1, TR2	WIT, VELTI
<b>AP_4</b>	Apps and Ads Profile Based Timeline	A, B, C	TR1, TR3	AMBIE, VELTI
<b>AP_5</b>	Anonymously and Non-invasively Context Based Targeting	C	TR2, TR3	VELTI
<b>AP_6</b>	Gamifications, Loyalty and Rewards	A, C	TR1, TR5	VELTI
<b>AP_7</b>	Profiling and Targeting Optimization	C	TR1, TR4, TR5	VELTI
<b>AP_8</b>	Privacy Control and Management	B, C	TR1, TR2, TR3	FOKUS, VELTI
<b>AP_9</b>	Social CBS and Multimedia Experiences	A	TR1	FOKUS, VELTI

### 1.3 Application’s Ecosystem (Roles Description and Operations)

The following image provides a high level overview of mobile marketing ecosystem and the corresponding role of OPERA App.



**Figure 1. Mobile Marketing and Advertising Ecosystem and the Role of OPERA App.**

The overall ecosystem has been detailed and analysed in deliverable D2.4. In the following the key role of the above ecosystem are highlighted and correlated to the use of OPERA application.

**A) End-consumers** (mobile web users, mobile application users, desktop web users).

- Search, discover and download OPENi enabled applications;
- Retrieve personalised recommendations of applications;
- Get personalised ads, in multiple channels, in accordance to their profile, interests and current context.
- View a timeline of their activities;
- Get rewards and loyalty offers;
- Control their personal data and manage their privacy.
- Efficiently control their personal data used for marketing and advertising.
- **Added Value:** *they receive more useful information, while they retain control of their data.*



**B) Publishers** (website owners, mobile or SmartTV application development houses)

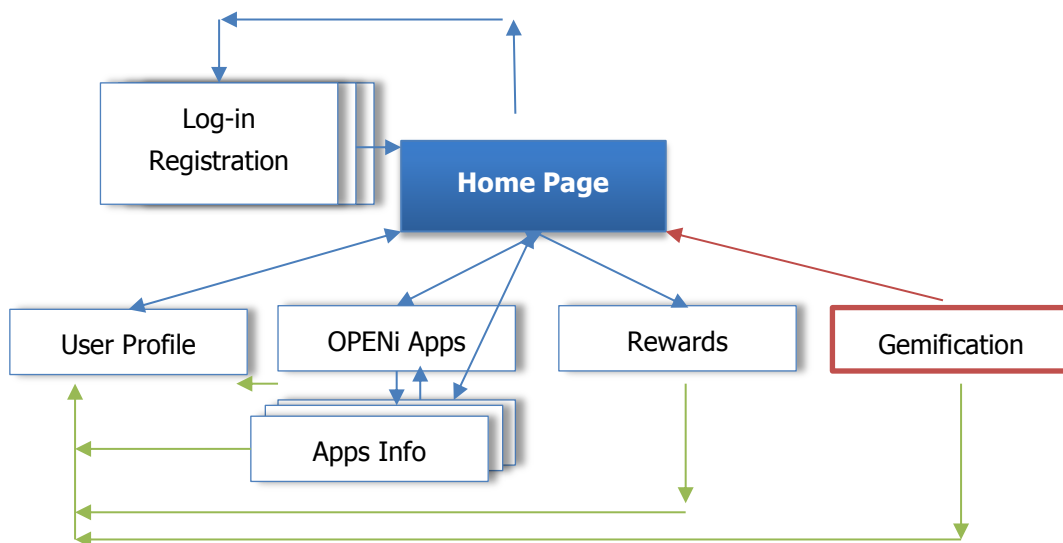
- Retain the option to use existing advertising models
- **Explore new marketing models with** ease for their business models (affect and control the value of their applications)
- **Retain control over what type of campaigns are visible to their end-consumers/users.**
- **Added Value:** *their consumers are more satisfied with more relevant campaigns, advertisers run more campaigns on their OPENi enabled applications (increase value).*

**C) Advertisers/Marketers** (agencies, brands)

- Enhance their capabilities to target personalised advertising and marketing campaigns but **in a transparent way and to the explicit control of the end-consumer.**
- **Added Value:** *they can perform better audience management and targeting*

**1.4 Initial Application Map (in terms of key basic UX/UI pages and sections)**

The following figure provides an initial version of the application map and corresponding pages



Main Functionality in Pages:

1. User Registration Page /and Log-in
2. User Home Page
3. OPENi Apps List Page
4. OPENi App Detailed Info Page
5. Rewards Page
6. Ads and Rewards Page
7. User Profile Page

## 2 Tasks 6.2 Applications’ Features Mapping to Corresponding Use Case (as described in D2.4).

### 2.1 Please justify how the envisioned application features are related to the corresponding WP2 use cases (Please provide covering %).

Based on D2.4, Task 6.2 should cover the five sud-scenarios Use Case. In the following the latter are detailed and corresponding % of coverage completeness is identified:

<b>Code number</b>	<b>PA.1 Scenario 1: Explicit Consumer Control of personal data for personalised advertising and performance analysis</b>
--------------------	--

Name	End-users/Consumers explicit control of their data for advertising
------	--

**Coverage: 100%**

<b>Code number</b>	<b>PA.2 Scenario 2: Targeted advertising</b>
--------------------	--

Name	Advertisers use OPENi opted-in users for targeted advertising
------	---

**Coverage: 100%**

<b>Code number</b>	<b>PA.3 Scenario 3: Using personal data from 3<sup>rd</sup> parties through OPENi for personalised advertising</b>
--------------------	--

Name	OPENi-enabled 3rd parties (operators, social networks, tracking service and more) must be able to offer optedin end-user data to any personalised ad.network with a compliant framework
------	---

**Coverage: 100%**

<b>Code number</b>	<b>PA.4 Scenario 4: Changing some of the data confidentiality rules</b>
--------------------	---

Name	It should be possible for regulators to change some of the data confidentiality rules per region/domain without the involved stakeholder to rework their systems.
------	---

**Coverage: 10%**

<b>Code number</b>	<b>PA.5 Scenario 5: Ad-supported business models for OPENi services API/Marketing Exchange</b>
--------------------	--

Name	make an OPENi service API available to be used in an ad-supported model (freemium business model)/OPENi Marketing Exchange
------	--

**Coverage: 100%**

Overall Coverage: 82% of the initial goals. Thus, additional features have been added.

## 2.2 Please specify WP5 SE that will be used and their corresponding role.

There will be four OPENi service enablers that will be exploited towards facilitating the features of the OPERA application:

### ***I. Timeline SE***

For enabling feature AP\_4: Visualize the use of their OPENi-application, recommendations and received ads history over time, with respect to their corresponding interest and context.

### ***II. Advertising SE***

For enabling features AP\_2: Get personalised recommendations for OPENi-enabled applications based on their profile, interests, current needs and context (stored in their Cloudlet), AP\_5 Get anonymously and non-invasively provide context based personalised and targeted ads, via OPENi-enabled application(s) and AP\_8 Control the provided cross-channel personalized ad services in an opt in and anonymised basis via OPENi enhanced Permission Visualization and Auditing features.

### ***III. Recommendations SE***

For partially enabling the feature AP\_2: Get **personalised recommendations** for OPENi-enabled applications based on their profile, interests, current needs and context (stored in their Cloudlet).

### ***IV. Analytics SE.***

For monitoring application performance and users interactions with the application.

### 3 Task6.2 Components-Based Effort Allocation

**3.1 Please specify the key features/tasks of the app(s) that will be implemented in your task and the corresponding partners that will be involved. (e.g., UI/UX design (VELTI), SE Integration (VELTI));**

**Table 2 Tasks 6.2 Main Tasks - OPERA Application Features & Initial Partners Assignment.**

Application Feature	Feature Description	Partner
AP_1	OPENi Enabled Apps Search, Discovery and Access	WIT, VELTI
AP_2	Personalised Apps Recommendations	VELTI
AP_3	Cross Channel Personalised Ads	WIT, VELTI
AP_4	Apps and Ads Profile Based Timeline	AMBIE, VELTI
AP_5	Anonymously and Non-invasively Context Based Targeting	VELTI
AP_6	Gamifications, Loyalty and Rewards	VELTI
AP_7	Profiling and Targeting Optimization	VELTI
AP_8	Privacy Control and Management	FOKUS, VELTI
AP_9	Social CBS and Multimedia Experiences	FOKUS, VELTI

Application Task	Feature Description	Partner
AT_1	UI Design and UX Flow	VELTI
AT_2	Core Application Development and SKD Integration	WIT, VELTI
AT_3	QA and Improvements	WIT, VELTI
AT_4	Usability Trials	FOKUS, VELTI
AT_5	Demonstrator Environment	VELTI

**3.2 Please verify and report on Task Partners interests, given current project evolution.**