

The AdCuration for Smart Advertising in Mobile Users

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Abstract. Recently, there are proposed new advertising models to set a trend that people always hold smart devices. So, intelligent advertising systems are required base on context awareness using smart devices. To do this, we propose an advertising curator with sensing, analysis and filtering the context. There are 4parts of the curator. Through the curator, simple context changes to a scenario which shows user's pattern. The curator determines both domain and type of content to hybrid customizing.

Keywords: Context Aware, Customized Advertising, Smart Advertising, Smart Curation, Mobile Cloud, Smart Service model, Smart Device

1 Introduction

A variety of fields by spreading smart devices, like smartphone, issues a massive change including contents service, such as kinds and types of services for users. In specific, a field of advertising reforms new strategy for users of smart devices [1]. Now, vast information rapidly is delivered into user's smart devices via internet searching action. But, users want to check information they need and to get service quickly in huge information [2]. Also, smart devices can obtain a variety of user' context information. The information makes use of a big advantage for advertising service. The advertizing providers can supply variety of content and type more specific than the previous to advertising target devices.

Accordingly, more smart advertising service is necessary for users with different needs by using context information that can be obtained from smart devices. To do this, we need Curator that chooses advertisements reflecting user's wants in overflowing advertising.

In this paper, we propose the Curator called *AdCuration* that can intelligently select advertising contents for promoting customer's interest and needs. The Curator generates user profile by combining a variety of user context as gender, age,

preferences, purchase history, GPS information and mobile device type. And then, specific content is searched and chosen by analyzing profile created for advertising services that is aligned to the interests and needs of user. Also, the Curator has a function that determines content media type aligned with devices information unlike pre-existing service system. So, we expect to improve the quality of service satisfaction because users receive services optimized for their devices in addition to needs. In other words, the *AdCuration* shows hybrid customizing by combining personal and physical.

2 Related Works

This section introduces variety of customized advertising services basis of both user LBS[3][4] and context awareness[7][8][9].

Location-based advertising services is one of the most first customizable advertising.

Havana suggested by Mahmoud and Yu is only one of advertising study based on location system[4]. However, the *Havana* has a weak point that user must explicitly request to the server when they want to get ad service. So, the *Havana* is no automatic.

Freezones[8] creates user profiles by using context awareness focused location. After that, the profiles are compared to that predefined target profiles by advertisers. By comparison with previously advertising services, the *Freezones* considers more context information. But, the *Freezones* has roughly customizing depending on specific profiles.

In recent years, the advertising model that considers not only the user's situation information but also preferences, symbols, and interest, and previous recorded history was proposed. By this study, user could receive more specific services tailored to user's own. The TMAS(Targeted mobile advertising system)[9] works as a platform lining merchants and consumers. Also, it has intelligent searching module, the key to TMAS, provides personalized search results according to contextual information, including the location, demographics, and preferences of consumers. This way is selecting ad contents using process to decide ranking base on recorded user pre-information. However, TMAS is just only system to decide contents category.

In this paper, we suggest a new notion for smart advertising tailored to user's context including device information. So, contents category as well as media type of contents is customized to the user.

3 Architecture of AdCuration

The *AdCuration* collects information of user's behavior from the real situation automatically for offering smart advertising to user. Also, the information is managed by processing with semantic and be stored. Then, the *AdCuration* makes user's knowledge for reasoning their needs or interest. In other words, the knowledge is a clue to determine kinds of advertising. The *AdCuration* chooses advertising domain and adapts contents type and configuration for smart device. So, the *AdCuration*

satisfies customizing both personal side and physical side. Fig.1 shows operation flow of the *AdCuration*.

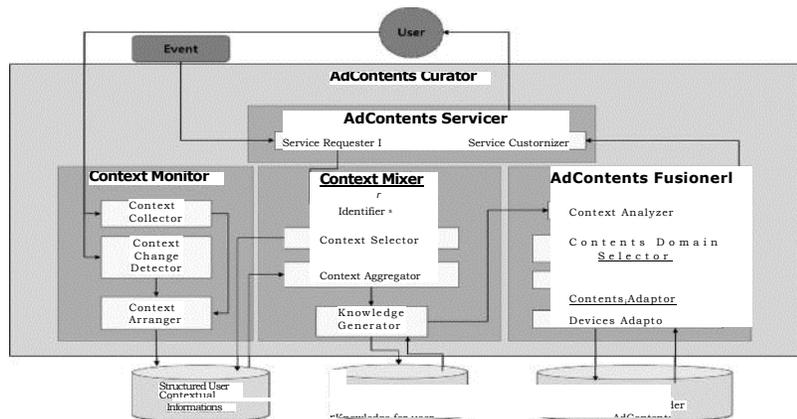


Fig.1 AdCuration System Architecture

The *AdCuration* consists of four parts as follow: *AdContentsServicer*, *ContextMonitor*, *ContextMixer* and *AdContentsFusioner*. Each part works with their main role and exchanges signals to make smart advertising..

- The *AdContentsServicers* receives signal of offers from advertisers in first *AdCuration* and checks customizable elements such as transmission environment, time finally.
- The *ContextMonitor* is responsible for collecting context information periodically. Moreover, the context is sorted and processed in a cluster for formation of user knowledge effectively.
- The *ContextMixer* is most important part of the *AdCuration*. In this part, plucking pattern of user behavior, needs and interest and expecting advertisements what users want. The *AdCuration* uses the scenario method for plucking pattern. So, contexts are converted into the knowledge by formatting one of the scenarios.
- The *AdContentsFusioner* is a part that generates advertisement based on the scenario in previous step. Through scenario analysis, a domain(kind, category, variety) of advertising is determined and configures the type and combination of contents according to smart device.

4. Function of the AdCuration

This section describes detail function of 4parts those make up the *AdCuration*. See Fig.1 for flow of each part.

4.1 AdContentsServicer

The *AdContentsServicer* has responsibility the first and last. The *AdCuration* is runed by the *ServiceRequester* which receives the advertising requests from advertisers. On the other hands, in the final point of the *AdCuration*, the

ServiceCustomizer checks to personalizing service environment such as network, delivery time and transmission speed to prevent uncomfortable in current situation of user.

4.2 Context Monitor

The *ContextMonitor* can maintain for checking user contexts regularly. The context includes basic identifying information(such as age, sex, kinds of calling service, device), recording of using application or web and sensing information(time, location, path of action, and so on) from real situation. This context is reproduced to acquire relevance of each data. For this, the *ContextCollector* collects newly information of user who detected first. The *ContextChangeDetector* checks changes of context periodically and records new information added in order to time for learning user pattern. But, information collected has the form of unstructured each other. So, the *ContextArranger* makes structure with semantic in the form of bundle. This bundle is called *ContextCluster* in this paper. Fig.2 simply shows the creation of the *ContextCluster*. This *ContextCluster* is a source that creates scenario of user to expect pattern or after action in next part the *ContextMixer*.

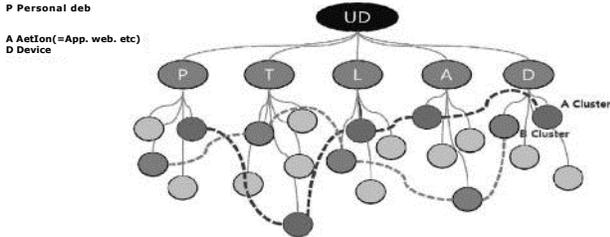


Fig.2 Schematization of making Context Cluster

4.3 Context Mixer

The *ContextMixer* creates user's knowledge that is formed scenario. The scenario is like directions for preparing a customizing advertising. So, Because of that, the *ContextMixer* is most importants part of the *AdCuration*. The *UselIdentifier* perceives targets and the *ContextSeletor* searches information corresponding sensing target in database of user's context(S tructured User Contextual Information). The information retrieved is created the scenario for expectation of behavior and preference. For that, there is collaboration of the *ContextAggregator* and the *KnowledgeGenerator*. The *ContextAggregator* organizes context elements by separating with analysis whether elements act effectively to reasoning user's behavior. The scenario consist of the following representative elements: time(T), location(L), device(D), using application(A)(but additional context is part of the scenario). Then, the scenario is created by the KnowledgeGenerator according time. So, the scenario shows the pattern of user's general behavior. Also, the scenarios can be recreation accurate pattern by prioritizing and filtering. Table 1 is simple example. Algorithm and method of reasoning pattern with the scenario is needed to expect user accurately. So, the study of this point will be scheduled.

Table1. Scenario

Time	Location	Action	Device	Scenario
T ₁ = morning	L ₁ = home	A ₁ = app	D ₁ = smartphone	S ₁
T ₂ = morning	L ₂ = street	A ₂ = web	D ₂ = smartphone	S ₂
T ₃ = morning	L ₃ = company	A ₃ = app	D ₃ = Tablet PC	S ₃

4.4 Contents Fusioner

The *ContentsFusioner* does searching, selecting and fusioning of advertising contents for hybrid adaptation of user. After the *ContextAnalyzer* loads and read the scenario, in personal, the domain or category of advertising is determined based on scenario in the *ContentsAdaptor*. The domain is a result of analysis of user situation and character. In physical, the type and configuration of contents is fit to user device in the *DeviceAdaptor*. So, user can be offered customizing advertising without discomfort of device. Finally, the *ContentsMaker* puts together total adaptations to make fusion content that is customized to user and selecting advertising according fusion. Table2 is the result of the *ContentsFusioner*.

Table2. The expected service based on Scenario

S	Domain of Advertisement	Location	Contents Type	Device	Other Device
S1	Healthy Food, vehicle, Sports Center, home appliances, etc	home	audio/ video/graphic	Tablet PC	TV,
S2	street Local ad., New Song, New Movie, Show timetable, etc		audio/image/graphic	Smart phone	null
S3	office supplies, Tasty restaurant, educational institute, ect	com pany	Video/audio/ graphic/ image/ text	PC	Smart phone

5. Experience

This section show the expected experience of advertisements based on scenario that created by the *AdCuration* in Fir.3. User receives the other advertising contents depending on S₁ and S₂. We will propose more specific describing of skill and appliance.

- S₁: The *AdCuration* detrermines an advertisement of health food for user. And content is composed of video, audio, graphic. These contents can be used without difficulty.
- S₂: The *AdCuration* detrermines an advertisement of new and popular album. Plus, considering that location is the way, contents of the advertisement have audio and simple graphic type.

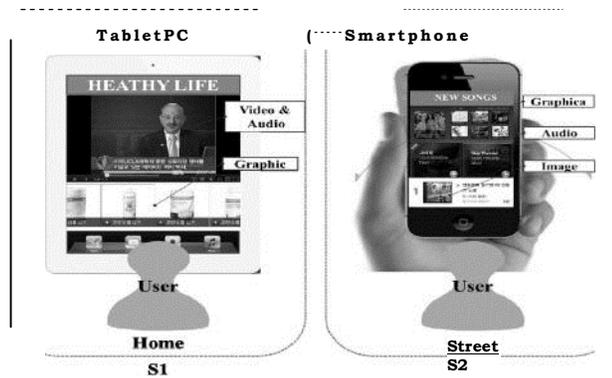


Figure7. Expected Advertisement Service based on Scenario by Curating

6. Conclusion

In conclusion, proposed the *AdCuration* is effective an advertising system for smart devices. This system makes it possible that selection of customizing advertisements intelligently. The *AdCuration* is hybrid customization by selecting contents domain and being adapted based on scenario. The scenario shows the pattern of user. So, the *AdCuration* can reason situations and needs of user after. We expect that user is satisfied with the advertisements which meets their needs, so that advertising effect is greater.

This paper presents overall concepts of the *AdCuration*. After, we will study more additional as processing algorithms and detailed technical description. Also, implementation is planned for sampling smart advertising service.

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