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Marketing insights for mobile advertising and consumer segmentation in the cloud era: A Q–R hybrid methodology and practices

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ABSTRACT

The mobile advertising paradigm is shifting from the web2.0 to the web3.0 generation in the Korean market and pursuing a customized and context-aware advertisement service for each consumer in this cloud computing era. In the Korean telecommunication market, the expanded demand for smart devices and the heralding of the 4G mobile broadband networks have increased the use of mobile applications and web services, with strengthened competition among advertising industrial players. Recently, as the mobile ecosystem becomes more complex, advertisement marketers are focusing on targeted marketing to customers to maximize the impact of advertising. Mobile advertising businesses should differ in terms of content and delivery patterns as to what users want, as well as how they react to different smart devices and platforms. The purpose of this study is to discover and theorize customer typologies based on Q theory's subjectivity in a qualitative approach and then verify and generalize sequentially these theoretical definitions and concepts through a combination of the Q and R empirical methods. The results of this research can be used as an antecedent of theoretical and industrial frameworks and a basic statistical data in advertising marketing and customer relationship management domains.

1. Introduction

The mobile advertising market is growing along with the spread of smartphone demand and 4G mobile broadband technology such as LTE (long-term evolution), HSPA (high-speed packet access), and EV-DO Rev. A/B. The government has announced that the official number of Korean domestic smartphone subscribers reached about thirty-six million as of September of 2013 [1]. A smart device represents a unique medium that can be characterized by the "24-hours within-30 cm" concept. This broadens the strategic position of mobile advertising businesses as a marketing channel to enhance the relationship with consumers as an emerging converging communication media.

According to eMarketer research, global mobile ad spending reached USD 6.43 billion in 2012 and Asia-Pacific is still an exceptionally strong mobile advertising market, particularly in South Korea and Japan. The market size of mobile ads spending reached USD 2.56 billion last year [2]. With dominant centralized enterprises such as KT, SKT, LGU+, Daum, and Google, the competition is expected to grow as well. It is important initially to discover targeted consumers' potential levels and external characteristics and requirements and then provide differentiated services based on each company's core capabilities, resources, and structural economic "ad-network" systems.

Recently, the telecommunications market is evolving from the "open, share, participate" web2.0 to the "cloud computing, semantic web, and context-aware" web 3.0 network generation [3]. In other words, the cloud computing

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environment represents a new mobile ecosystem in which anyone, anytime, and anywhere can make better use of on-demand IT resources such as infrastructure (IaaS), platforms (PaaS), and applications (SaaS) through the Internet [4]. Thus, IT innovation is also surmounting new challenges in which advertising entrepreneurs focus on improving customer relationships, as well as communication. In the cloud computing market space, mobile advertising businesses understand and respond to changes in consumer voices and trends [5,6].

The purpose of this study is to propose a theoretical framework and mixed-approach methodology appropriate as a marketing strategy based on customer psychological typologies in smart mobile advertising industries for the future. To do this, it is critical to move away from previous demographical criteria or researcher-oriented empirical research to theoretically shed light on the taxonomy of consumers according to consumers' internal "subjectivity". In the field of advertising, Q theory or method can overcome the limits of the external perspective of demographical market segmentation and hence, this will be useful for establishing business strategies or for analyzing the effectiveness of advertising marketing [7,8].

This study employed a mixed methodology of creative Q–R tool that links the Q method, as a qualitative approach, and the R method, as a quantitative one. We undertook a Q study to understand "social characteristics" through "operant definitions" from respondents' intrinsic human attributes, specifically "subjectivity" after which we continued sequentially with an R study for generalization and verification of the Q results [9]. To connect two comparative studies, this study developed a Q–R analysis tool (Q tool). Thus far, however, smart mobile advertising remains an emerging market and examples of applied Q models are rare in this field of consumer subdivision research. The Q tool can compact implicitly massive customer subjectivities through a Q typology process. Therefore, the results of this study will provide a theoretical framework and industrial insight and implications to marketing personnel or policymakers who plan CRM (customer relationship management) or market-segmentation strategies.

RQ1 how subjective types such as beliefs, values, attitudes, evaluations, preferences, and the tastes of smartphone users as they regard to smart devices can be categorized and what the characteristics of each type are (Q study).

RQ2 how typical distribution sizes and correlations among types are shown (Hybrid Q–R study).

2. Literature review

2.1. Smart mobile advertising

As smart devices and 4G mobile broadband spread in the telecommunications market, the use of the mobile web or applications continues to increase and the platform competition among enterprises continues to intensify. The development of core network technologies such as Wi-Fi (wireless fidelity), hotspots, and Bluetooth were important turning points in the growth of mobile advertisement industry [10,11]. The mobile ecosystem has become complex and as such, mobile advertisement businesses should seek targeted markets, targeting customers to maximize the effectiveness of their advertising. This depends on the attitudes and reactions of consumers who are exposed to mobile advertisements and, they, in turn, directly affect the impact of advertising [12,13].

Particularly in the cloud era, a context-aware, personalized and intelligent marketing strategy can enhance the product value of smart mobile advertising. A mash-up type of context-aware advertising, which grafts flexibly and real-time user personal information including the profile, location, and usage data, appeals in that it has advantages of offering smart mobile advertisements [14,15]. In brief, a smart mobile medium is a converging channel for the adverting marketing and is a platform that contains advertisement applications and contents or unique hardware. In other words, it is the best communication tool for connecting an advertiser's brand and its consumers.

Recently, the structure of mobile-advertising industry in Korea is in the process of forming a new paradigm where interests of diverse stakeholders are intertwined. In terms of demand, this transformation is aided by the strengths of mobile devices, booming app stores; in terms of technologies, it benefits from advances in the provision of broadband and alternative networks, cloud computing, mobile display, and transaction-settlement technological prowess, and mobile-advertising platforms. Stakeholders in different industries – major domestic mobile carriers such as KT, SKT, and LGU+, and portals – and global corporations such as Google, Apple, and Microsoft are aggressively entering domestic Korean advertising industry through proactive use of consumers' mobile networks and web traffic.

Cloud computing, in particular, is emerging as an alternative not only for large-sized smart mobile-advertising content (SNS, streaming multimedia, cross media or n-screen, LBS, QR or AR, and integrated advertising), but also "data warehouse" that can maximize the advantages coming from consumer "personalization" where each consumer's information is stored, managed, analyzed, and mined. Moving forward, the Korean market is fast evolving into an era of context advertising where advertising platform on which multiple devices are integrated as they are centered on "mobile advertising" – cloud computing – n-screen, allow behavioral targeting, context-awareness, and delivering personalized advertising messages based on consumers' subjective behavioral patterns and tendencies [16].

This study determines the range of "smart mobile advertisements" as mobile advertisements that go beyond the mobile2.0 generation and defines this range as "all next-generation advertisement services provided through smart devices based on wireless networks and platforms". In this study, the mobile advertisement platform is a solution that is specialized for mobile advertising. A smart phone is a typical smart device and convergence medium, and it is an efficient processor or application in the form of a user productivity-enhancement system, with various functions such as voice calling, data, e-mail, and Internet search capabilities [17]. Smart mobile advertising media is an interactive communication system that pre-identifies consumer preferences and then delivers customized advertising messages or services to each user. It is important to deliver proper or differentiated advertising products based on consumers' attitudes and personalities [18,19].

At present, the smart mobile advertisement market in Korea is taking notice of the core technologies of cloud computing. Examples include: targeting context-aware ads, real-time LBS (location based service) ads [20], interactive-rich media ads, mobile semantic webs or in-app ads, advanced banner ads or incentive-based coupon ads, AR (augmented reality) or QR (quick response) codes, social network ads, n-screen ads, and especially integrating and converging multi-functional mash-up ads involving a mix of the aforementioned [21–23]. Smart mobile advertising products continuously derive combined services where two or more advertising techniques integrate and interlock due to innovative hardware or software technologies.

2.2. Consumer subjectivity and taxonomy

Many studies have focused on customers' behavioral and motivational characteristics based on their acceptance of advertising from the perspective of researchers' operational definitions or researchers focusing on empirical studies of "verifying outside behavior character" [24]. In the smart mobile advertising market, smart device users create actively economic business and consumption activities and communicate as the main subject based on their subjective feelings. They are not passive audiences who react unilaterally after being exposed to advertisements [25]. Therefore, if one is to expect both academic and industrial contributions in the field of advertising research, the "ab intra"-based research that considers participants' viewpoints resulting from subjectivity of each consumer is more important. "Subjectivity" refers to a type of communication from consumers' points of view [26]. In short, the marketing strategy of smart mobile advertising should begin with accurate recognition of each consumer type and subsequently focus on providing proper concepts of advertising items to potential consumers.

Thus far, basic theories of customer taxonomy include the Theory of Diffusion of Innovation, the Marketing Funnel, Lifestyle Theory, and the Digital Nomad theory. Rogers (1995) divided customers into five types: the innovator, early adopter, early majority, late majority, and laggard in the order of their sequence of purchasing new products [27]. Marketing Funnel theory uses the five steps of awareness, familiarity, consideration, purchase, and loyalty as levels of consumer loyalty. This theory emphasizes that it is effective to vitalize communication to pinpoint customers' desires as to engage potential customers. Research about customer lifestyles focuses on the scope of psychological and cultural differentiation, e.g., a series of life patterns, behaviors, and thinking derived from a set for values from a family or a person. Attali (1992) suggested the keyword of a "digital nomad" that defines a new type of consumer, specifically a mobile handheld user with mobility who is decentralized and under a disaggregation of boundaries [28].

Other research has attempted to understand social characteristics stemming from human nature and subjectivity. Due to the validity and practicality of the Q method as assessed by Stephenson, it is gaining traction in consumer and market segmentation studies. The range of research is also expanding to include advertising as a creative, communicative marketing strategy and to areas of analyzing effectiveness and policy research. The application of Q theory can overcome the limits of demographics-based market segmentation, and it is useful in effectiveness analyses and for establishing strategies for targeting audiences based on psychological segmentation of consumers [7]. Today, as new advertising media types such as the newspapers, the broadcasting, the Internet, and the mobile type of the recent past, the academic and industrial interest about market segmentation – as derived from customers' fundamental motivations and internal subjective natures in relation to advertising – are growing.

2.3. Q methodology

The Q method is a typical qualitative research approach that seeks to discover and interpret inner properties such as human feelings, preferences, emotions, ideals, and tastes based on process theory. This is a methodology, a model, and a theory that is useful in "self" or "subjectivity" research in interpreting customers' experiences and attitudes in the field of marketing research. In other words, "subjective communication" with the real world, which has an experiential meaning latent within each person, can work inside an "internal frame of reference". It is known as the mental thinking structure, or "schemata", as expressed in questionnaires using words such as "to me" or "in my opinion" [29].

In marketing, Q method has a close relationship to research on consumer behavior. As numerous theories on consumer behavior attest, human behavior, till an action of purchasing results from a stimulus, is influenced holistically by various inner "parameters." [30]. Here, the parameters refer to innate psychological processes such as motivation, recognition, awareness, learning, and attitude, experiences that are psychological characteristics. Because such "subjectivity" in consumer behavior is mixed as complex interactions, there is a limit to interpretation based solely on statistical estimation by conventional evidence-based research. Marketing researchers have proven that while consumer behavior research could discern consumers as a group – not as individuals – with similarities, they are not all the same, thus suggesting the importance of subjectivity research in consumer behavior.

Q method, as a scientific discovery, proposes a new approach to researching human (consumer) behavior. The rationale underlying Q method is often compared to a flashlight in a dark room. It is not an operational concept that has already determined what the room should contain but a methodology that generates hypotheses with focusing on "discovery" [7]. According to Table 1, compared to the Q method, the R method is a relatively simple type of empirical or quantitative study. The variable of R consists of measurable items or stimuli, whereas that of Q is a person. The objective of R is in estimating the characteristics of a population from the characteristics of a sample of people.

Therefore, a large enough sample size is a prerequisite for R. On the other hand, the process of Q sampling is more complicated. Because appropriate motivation and stimulation are required to obtain every expression of subjectivity for the Q sorter, it is crucial that the researcher proceed with care. In brief, Q involves research on human beings. This is not about "inter-individual differences" regarding one stimulus but is "ipsative" research that concerns the structure of "intra-individual significance" [8]. 'Ipsative' means "of the self". It utilizes a measuring

Table 1
Comparison between R and Q methodology [8].

	R method	Q method
Object of study	Objectivity: objective phenomenon, observation is possible and measurable	Subjectivity: tendency such as feeling, viewpoint, opinion, belief, preference, image
Property	World of work: information, need, rationality, persuasion	World of play: communication, want, emotional, enjoying
Variables	Demographic information of human being, mental property	Person
Measurement method	External explanation: operational definition	Internal understanding: operant definition
Theoretical assumption	Individual differences	Intra-individual difference in significance
Scientific purpose	Generalization through hypothesis testing	Abduction, confirming theory, verification
Scientific logic	Induction, deduction	Abduction
Performance property	Social control	Convergent selectivity
Self-attitude	Self-decline	Self-enhancement
Communication	Communication distress	Communication satisfaction
Self-structure	Mine/me	Me/I
Value structure	Instrumental value	Intrinsic value

process from "the most agreeable" (+) and "the least agreeable" (−) for two or more statements (Q samples).

3. Research design and method

3.1. Study 1. Qualitative aspects

The Q method includes a series of "Q sorting" analysis processes, proposing stimuli "Q samples" compressed out of a "Q population (concourse)" to "P samples (Q sorters)" taken from any "P population" in the form of a card. Q samples are the statements or objects that P samples should categorize. The Q procedure is composed of six stages: establishing of the Q population, Q sampling from the Q population, selection of the P sample, Q sorting and data coding, analyzing the Q factor, and discovering and interpreting the discovered typologies.

3.1.1. Establishing the Q population and Q samples

The Q sampling process from the Q population is the most important step in a Q study. As discussed in Section 2.3, the R method has people as its sample and by obtaining a set of population and it appropriately selects the number of samples so that they become "representative." Such process is focused on estimating the population through sampling based on standard errors – that occur when selecting a sample – and goodness of fit for the research model. On the other hand and unlike the R method, because Q method is a research that classifies people into types, instead of investigation items (or stimulus items), and interprets each type thus derived. As such, its focus is on humans.

Especially in advertising marketing, because the Q method is appropriate for interpreting the types of people for the research topic, one can discover idea or symbols useful for market-segmentation strategies or market positioning. The population for the Q method can be defined as all self-reliant statements or a concourse of investigation items classified by respondents as they regard to the research topic. Thus, constructing a Q population is the basis and essence of Q research.

Essentially, Q focuses on theoretically conceptualizing the subjectivity of each P sample. The Q population refers to a value system pertaining to subjective perceptional tendencies such as a respondent's thoughts, attitudes, preferences, tendencies, and experiences. Here, this concerns smartphone users. Establishing a Q population involves collecting all stimuli or statements regarding the research question. Therefore it starts with the definition of the population.

A researcher should obtain statements that should be included physically with the Q population in succession, based on face-to-face in-depth interviews and through a literature study. During the interviews, if a researcher collects fifty statements in the first interview, he/she will necessarily collect less than fifty statements during the next interview because duplicated statements are excluded. As the number of interviews increases, the number of statements decreases and becomes saturated at some point.

The ideal size a Q sample is forty to sixty statements based on the principle of general rule-of-thumb. If the questions of Q statements are relatively simple, collecting more than sixty is feasible. If a rather complicated statement is included, the number is limited to thirty or less. Because Q samples are extracted from an identifiable group of a Q population, the sampling rules and procedures in R can be applied. In this study, thirty-one smartphone users as typical customers of smart mobile advertising were selected by considering their demographic variables, e.g., gender, age, job, education, residence, and device type.

This study repeated thirty-one interviews in order to obtain as comprehensive Q population as possible. Additionally, we added more data from well-known online communities, blogs and literature reviews. Thus, a total of three hundred and sixty-three Q population statements were gathered. First, after excluding duplicated statements, the remaining statements were categorized into the following nineteen subgroups: m-commerce, personalization, economic, functionality, substitutability, design preferences, lifestyle, attraction, inconvenience, sociality, for business, portability, resistance, surrounding awareness, addiction, toys, learning effect, innovative, and capability. This categorization helps to reflect the variety in and the overall set of user opinions of smartphones without the Q sample statements being biased to a certain category. Each Q sample was classified into positive (18), neutral (14), and negative (12), ultimately comprising a total of forty samples as shown on Table 2.

3.1.2. Selection of P samples

A P population is the actual group of respondents and P samples are respondents who actually participate in Q sorting. Because a larger P sample causes statistical problems, the Q method follows Stephenson's small sample principle

Table 2
Q samples.

No.	Statements
1	With a smartphone I can enjoy more with my friends and build friendships.
2	It is very convenient for me to use a smartphone to shop and make mobile transactions without the limitations of time and place.
3	When meeting acquaintances, each one plays with a smartphone so there is less conversation and more private thinking.
4	When traveling on subways and buses, there is less time to face other people and less scenery.
5	The user must be smart to use a smartphone economically.
6	I reduced my living expenses to afford my smartphone bill, services, and to purchase external devices.
7	The outstanding quality and functions (touch feel, the interface, the response speed, and the compatibility) are attractive features of a smartphone.
8	I think different performance can be attained depending on how I manage and use a smartphone.
9	It feels like I use a computer, a laptop, and a PDA at the same time when I use a smartphone.
10	It feels convenient because I can read an e-book or utilize books, documents, or note functions with a smartphone when traveling.
11	I think the sophisticated design (hardware) is the attractive part of a smartphone.
12	Operating a smartphone is more convenient than using a feature phone and the interface menu formation is more direct; thus, there are lots of functions for convenience.
13	My lifestyle has changed a lot since I started using a smartphone in my everyday life.
14	A smartphone provides me with useful information and experiences, making it appear as though the quality of my life is improving.
15	I think a smartphone is not a luxurious item, but rather a must-have item in this modern society.
16	As I use a current model of a smartphone, my preference for this company brand and product is increased.
17	Because there is personal information saved on a smartphone, one must be careful not to break or lose it.
18	I use a smartphone for web surfing and checking e-mails constantly, but I feel uncomfortable because the screen size is too small.
19	I have little mechanical knowledge and am not familiar with new things, so I started using a smartphone after a recommendation from acquaintances.
20	It is fun to have conversations with other users about applications and to share information.
21	It is good to have real-time communication and build a community with acquaintances using SNS(Social Network Service) with a smartphone.
22	As work productivity has increased with the use of a smartphone, a smartphone is frequently used for business use.
23	It is possible to engage in multi-tasking, such as sending a message while searching the App store.
24	Location-based services are the most advantageous part of a smartphone, and location searches using GPS and a navigation system are very convenient.
25	I think having the 'Internet in my hand' is the most appealing part of a smartphone. It is possible to search for information while traveling.
26	A smartphone is 'a cell phone with computer that is always on'.
27	I am still unfamiliar with using a smartphone, and I do not know why a smartphone is that good.
28	I purchased a smartphone because people say it is good, but I only use certain functions such as calling and sending messages.
29	I feel proud when people around me tell me my phone is good, and I enjoy it when people look at it.
30	Because a smartphone is a general trend these days, it feels I am one step behind the trend if I do not have one.
31	I feel like my smartphone is with me 24/7.
32	If I forget to bring a smartphone or it breaks, I feel like I lost a friend.
33	I think a smartphone is a toy for adults. There are various enjoyable types of content such as music, movies, games, videos, and applications.
34	It is never boring with a smartphone when I am alone, as there are interactive applications and social games.
35	It feels like I am experiencing a new world when I use a smartphone.
36	The more I use my smartphone, the more I become familiar with the smartphone. One must try to study by oneself to use a smartphone effectively.
37	I am interested in the newest smartphone devices, that I am expecting a newer version of the product.
38	It is amazing and fun experiencing new smartphone technology such as AR or QR code.
39	It is attractive about a smartphone that many user-friendly applications and types of content are available.
40	I have 30 or more applications on my smartphone now, and I make good use of them.

based on Q theory. It is most desirable to sample respondents who have different but uniform opinions, such as persons with a special interest in this research topic, dispassionate judges, authorities and experts, those with a class interest, and those who are uninterested or uniformed. This study selected forty-three samples based on "purposive and judgmental sampling" and "snowball sampling" with consideration for demographics variables.

3.1.3. Q sorting

Q sorting is very similar to rank ordering. Typical Q sorting starts with a researcher proposing a group of Q samples to Q sorters with the respondents arranging stimuli in the order of importance from his/her subjective points of view. It is not about obtaining a "black and white" opinion (agree or disagree) about a Q sample but about observing the sorting process arranging into a forced distribution. In brief, the results of Q sorting are "subjective opinions of respondents about a certain question". Generally, the desired Q sorting time is between 30 and 40 min.

This study follows the card arranging rule of a traditional Q method with the addition of a re-designed FlashQ software offline version for effective sorting by overcoming any gaps in time and/or geographical locations. The FlashQ program is a "drag-and-drop" method that runs on a source platform, similar to sorting paper on an offline tabletop. To observe a respondent's Q sorting process directly, we commit the sorting work using both a remote instant messenger and one-to-one interviews. There is a little difference in the sorting time per P sample, but this method was suitable, as the average lead time was 30 to 40 min. The distribution shape of the Q pyramid adopted a nine-point scale from "strongly disagree" (−4), to "neutral" (0), to "strongly agree" (+4) and the frequency of each scale was as follows: 3, 4, 4, 5, 5, 5, 4, 4, and 3.

3.1.4. Q factor analysis

Prior to the Q factor analysis, each scale is converted to a calculative score and 1 point, 5 points, or 9 points are assigned to strongly disagree (−4), neutral (0), and strongly agree (+4), respectively. To categorize smartphone users, this study analyzed the Q sorting materials with a principle component analysis, Varimax rotation, and correlation analysis using the QUANL PC program. A Q factor analysis is the

process of self-grouping people with similar thoughts about a certain topic. In other words, it is not a grouping of people sharing certain attributes but a typology of each person's subjective thoughts. A total of thirty-six data items were used in the Q analysis after excluding forty-three P samples due to missing content.

As shown in Table 3, four types of smartphone users were discovered. The Eigen value is a sum of factor loading values, and other values refer to the variance, total variance, and cumulative variance. The factor weights for each of the four types are 11.1838, 2.7923, 2.6002, and 2.1069, respectively. As a result, each Eigen value per factor is probable (all more than 1.0). The cumulative variance was determined to be 0.5190 (52%). The factor weights of the P sample are categorized as T1 type (n = 14), T2 type (n = 4), T3 type (n = 9), and T4 type (n = 9) for a total of thirty-six. Among the types, as the factor weight of the P sample becomes higher, the representativeness of the typical person of the relevant type increases. Factor loading value is $>0.309(1.96 * 1 / \sqrt{40})$ at significant level 95%. Demographic data of P samples refers in the Tables 3 and 4.

3.2. Study 2. Quantitative aspects

3.2.1. Hybrid Q–R methodology with Q-tool

This study designed a Q tool as a Q–R method that forms a link between qualitative and quantitative research (See Fig. 1.). The information required to build the Q tool was derived from the Q analysis [31]. Q-tool is a mixed-method tool that links qualitative and quantitative methods that enhance the usefulness of the Q method. As seen in all Q methodology procedures in Section 3.1, in theory, Q research is already imbued in qualitative and quantitative aspects based on the abductory perspective, from preparing Q samples to extracting Q factors. In spite of that, the researcher, from an even wider viewpoint, may discover Q factors (types) through Q research but see how actually-confirmed types manifest themselves in what distribution ratios in real life, as well as how they relate to other variables.

Here, since Q-tool is unable to conduct Q research on a large group of respondents, it is an assessment tool that often defines Q types in concise and characteristic manner. In developing an assessment tool, although there was the first Q-block method by Talbott (1963), this research adopted the technology method of a Q tool that Kim (1998) developed to analyze value types for Korean consumers [32,33]. In recent marketing and policy research seeking to research behavior of consumers (respondents) and analyze markets, the need for mixed-research that utilizes an assessment tool such as Q-tool [23,34].

In detail, the development process of the Q tool begins with an interpretation of each type discovered from a Q study. Next, from the result of Q factor array (the Q factor sort values for each statement) analysis, differences among the Q samples plus the discriminant power between the standard score of each type are used to create the Q tool. When the Q sample and the cross-standard scores of all types are compared, the Q samples with the highest discriminate power, such as those at more than +/− 1.00, are selected as the representative sample of the type. Lastly, the final step in the creation of the Q tool is to name and to define unique properties that can identify each type.

Eventually, through the Q tool, it becomes possible to measure the distribution patterns of smartphone users' Q factors in the real world, i.e., what type of person belongs to what type of user group, or to verify the relative tendencies per type. Therefore, the Q tool can be used as a measuring tool that proposes a brief marketing strategy based on the viewpoints of consumers' psychological typologies on smart mobile advertising.

3.2.2. R methodology based on empirical approach

The quantitative surveys were given to three hundred and seventeen smartphone users using Apple (iPhone), Samsung (Galaxy), LGU+ (Optimus), Sky (Vega, Mirach, Sirius, Izar), HTC (Desire, Nexus One, Legend), KT (Take), Motorola (Droid), Nokia (X6), Blackberry, and Sony Ericsson devices. However, the survey was limited to users who purchased their phones

Table 3
Demographic characteristics of P samples (Q study).

Type	ID	Gender	Age	Education	Type	ID	Gender	Age	Education
T1 (n = 14)	1	M	30s	PG	T3 (n = 9)	3	F	20s	PG
	6	F	30s	G		4	M	30s	G
	7	M	20s	G		5	M	30s	G
	8	F	20s	PG		13	F	20s	G
	11	M	30s	PG		22	F	20s	G
	12	F	30s	PG		26	M	30s	G
	14	F	20s	G		28	M	20s	PG
	16	F	10s	HS		31	F	30s	P
	20	F	30s	G		32	F	20s	G
	24	F	20s	G	T4 (n = 9)	2	F	30s	PG
	27	F	30s	G					
	33	M	40s	G		10	M	20s	U
	35	F	30s	PG		15	F	30s	G
	36	F	20s	PG		17	M	30s	PG
						19	F	20s	U
T2 (n = 4)	9	M	30s	G		21	F	30s	G
	18	M	30s	PG		23	M	20s	G
	25	M	20s	PG		30	F	20s	G
	29	M	30s	PG		34	F	30s	G

Table 4
Results of Q factor analysis.

Q Sort		Factor loading				Factor weight	Eigen values	Variance (cumulative variance)
		Q1	Q2	Q3	Q4			
Type 1	P12	**.714**	.123	.045	.019	1.4564*	11.1838	.3107 (.3107)
(N = 14)	P35	**.722**	−.193	−.082	.089	1.5063*		
	P14	**.740**	.017	.242	.111	1.6365*		
	P11	**.663**	.139	.198	.095	1.1809*		
	P06	**.800**	.155	.186	.217	2.2186*		
	P07	**.719**	−.202	.182	.181	1.4910*		
	P27	**.729**	.288	.143	.198	1.5529*		
	P01	**.647**	.299	.152	.024	1.1129*		
	P16	**.572**	.146	.254	.162	.8496		
	P20	**.664**	−.145	.015	.468	1.1886*		
	P33	**.426**	.302	−.163	.111	.5206		
	P24	**.451**	.235	.339	.318	.5658		
	P08	**.393**	−.262	.260	.314	.4658		
	P36	**.393**	.370	.237	.379	.4654		
Type 2	P09	−.112	**.599**	.086	−.140	.9350	2.7923	.0776 (.3882)
(N = 4)	P29	.405	**.667**	−.094	.093	1.2005*		
	P18	.078	**.492**	.242	.270	.6492		
	P25	.290	**.507**	.096	.240	.6830		
Type 3	P13	−.015	−.063	**.672**	.247	1.2237*	2.6002	.0722 (.4605)
(N = 9)	P26	.078	.336	**.623**	.035	1.0190*		
	P31	.004	.161	**.587**	.351	.8947		
	P28	.301	.161	**.627**	.236	1.0318*		
	P32	.204	−.064	**.436**	−.288	.5376		
	P04	.185	−.336	**.462**	−.019	.5865		
	P03	.136	.436	**.515**	−.140	.7006		
	P22	.482	.072	**.511**	.243	.6905		
	P05	.337	−.390	**.455**	.298	.5735		
Type 4	P17	−.191	.171	.065	**.624**	1.0214*	2.1069	.0585 (.5190)
(N = 9)	P15	.424	.077	−.213	**.747**	1.6891*		
	P10	.105	−.223	.304	**.570**	.8456		
	P23	.458	−.119	.043	**.664**	1.1892*		
	P34	.224	.003	.206	**.404**	.4826		
	P19	.512	−.112	.158	**.577**	.8656		
	P30	.418	.268	.055	**.521**	.7159		
	P02	.177	.255	.424	**.539**	.7605		
	P21	.428	.180	.315	**.472**	.6076		

Factor weight.
Factor loading value is >0.309 (refer to Section 3.1.4) and * means Factor weight >1.0
* >1.0.

directly. The scope of this quantitative study was to verify and generalize statistically theorized customer typologies in the Q study and to examine users' lifestyles, usage patterns, preferred ads and apps, and demographic features as they related to a smartphone for each Q type. Thus, this study can suggest a theoretical methodology and a new strategic framework for mobile advertising marketing that can target consumer subdivisions and that will be practically applicable to the m-commerce market. For the analysis, we used SPSS 19.0 and used the frequency, a cross-tabulation, a one-way ANOVA, and a post-hoc comparison among the groups referred to below Table 5 and Fig. 2.

4. Results and findings

4.1. Interpreting consumer typologies

Previously, smartphone users were categorized into four schemata according to their psychological perceptional characteristics. Each type exists separately with unique factors. The interpretation of the Q factor is not based on a hypothetical-deductive point of view but rather on a hypothetical-creative point of view. Therefore, it is a process of searching for an answer or an explanation to explain the distribution of the Q sample. To analyze each type, a researcher must try to mini-

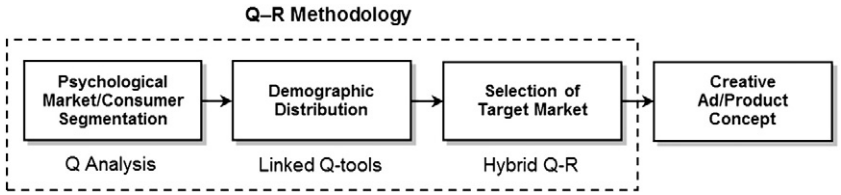

Fig. 1. Research design and process.

Table 5
Survey questionnaire (R Study).

Using device	Apple "iPhone" (), Samsung "Galaxy" (), Others ()
Service period	() months
Duration of usage/day	() hours (* excluding voice service)
Purpose of usage	SMS (), Applications (), Internet surfing (), e-mail (), Messenger (), SNS (), Media/Streaming videos (), Game ()
Type of favorite apps	(), (), ()
Times of app-downloads	()/month
Preferred ads	Mobile web banner (), Streaming videos or TVs (), In-Apps (), Coupon () Mobile code/QR (), LBS (), AR (), SNS (), e-Book (), Rich-media ()(* multiple choice)

mize decision errors and exclude any subjective premise or prejudice by reflecting upon the theoretical basis of the research topic, the demographics data, any additional survey information, and post-interview data about two bipolar factors of Q sorting. To understand the clear differences among the types, "strongly positive" (standard score $> +1.0$) and "strongly negative" (standard score < -1.0) among the Q samples were distinguished.

4.1.1. The business partner (T1)

The exceptional feature of the first type of users is that they actively use their smartphones for business use and/or to promote work productivity. As shown in Table 6, they consider a smartphone as a business partner and positively evaluated mobile work functions such as instant e-mail, scheduling, and a note manager as the "internet in the hand" (#22, $z = 1.48$). Specifically, the standard score (z) difference between the Q sample (22) value and those of other types was calculated to be $z22 = 1.061$. This type of user, who is familiar with mobile business, showed an increase in the frequency of using smartphones for business in their everyday life. The business coworker type understands that how they manage and use a smartphone affects the usability and performance of the device. Common opinion holds that it is crucial to select and use content types and services competently according to one's own tastes and purposes (#8, $z = 1.78$); to use a smartphone effectively as a supportive work device, self-study is required. This implies that they clearly understand the importance of learning in accommodating a smartphone as an informational device (#36, $z = 1.09$).

Overall, the first type of users are relatively skilled in smartphone use, and the level of satisfaction about the practical benefits and effectiveness of smartphones in their work environment is high (#27, $z = -1.30$). In addition, the expectation toward a smartphone is high, and they are sensitive to risk factors such as failure, loss, and security problems due to carelessness. In particular, they are highly negative about the possibility of losing personal information saved in a smartphone. To consider this psychological characteristic of the first type of P sample respondents in detail, the interview material in relation to the stimuli of Q sorting was analyzed. They always take care not to lose saved personal information on a smartphone device; however, as the usage of mobile banking and business certificates increases, the confidence with reference to security problems such as voice-phishing and hacking decreases.

On the other hand, they are mostly not interested in sophisticated designs or the appearance of smartphone hardware (#11, $z = -1.17$). And they try to avoid investing time and money from experiencing cultural content or services that are not business-related, such as games, SNS,

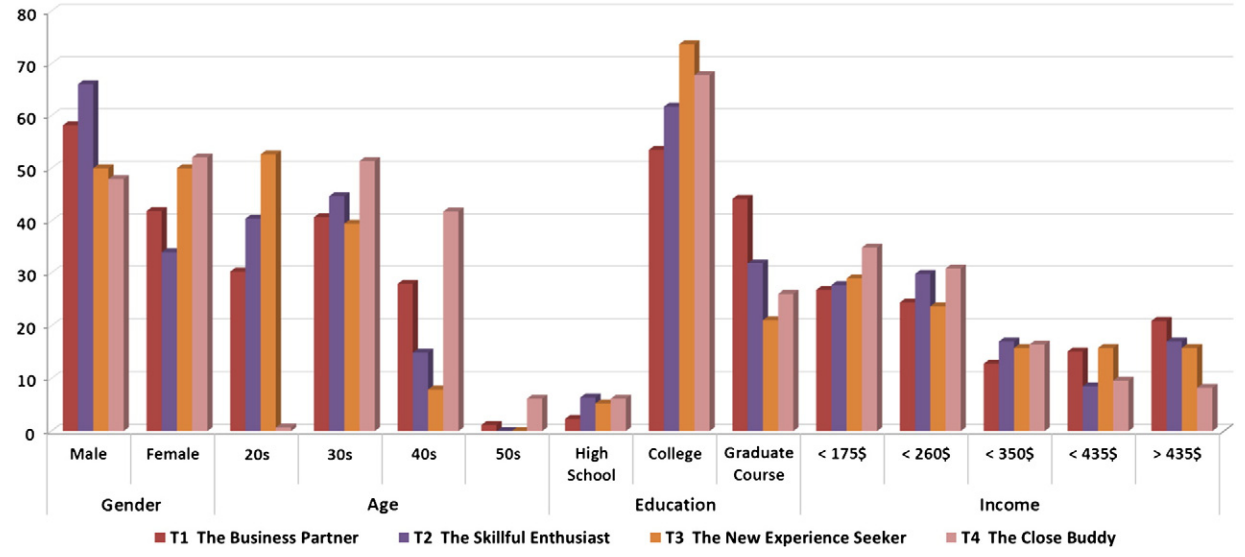

Fig. 2. Descriptive and demographic analysis of respondents.

Table 6
Representative Q samples (z-score > ±1.00) of each type.

Q sample	z-score	Q sample	z-score	Q sample	z-score	Q sample	z-score
T1 positive		T2 positive		T3 positive		T4 positive	
8.	1.78	24.	2.06	17.	1.61	25.	2.07
22.	1.48	5.	1.85	8.	1.42	9.	1.60
21.	1.47	8.	1.79	21.	1.29	24.	1.42
13.	1.40	25.	1.63	35.	1.05	7.	1.28
25.	1.29	7.	1.39	39.	1.03	18.	1.14
36.	1.09	18.	1.06	negative		22.	1.05
Negative		23.	1.06	28.	−1.24	10.	1.03
4.	−1.08	17.	1.03	10.	−1.67	negative	
1.	−1.11	11.	1.02	29.	−1.89	29.	−1.00
11.	−1.17	Negative		6.	−1.95	34.	−1.05
27.	−1.30	20.	−1.04	19.	−1.97	37.	−1.09
2.	−1.39	34.	−1.11	27.	−2.29	32.	−1.09
34.	−1.43	32.	−1.36			11.	−1.16
29.	−1.49	29.	−1.63			6.	−1.48
32.	−1.78	9.	−1.70			3.	−1.54
6.	−2.02					30.	−1.56
						28.	−1.94
						27.	−2.17

and m-commerce (#2, z = −1.39). The only time the first user type uses social applications is for real-time business meetings, official communications, and for community management activities. As the applicable range of smart work expands, these users are expected to increase (#21, z = 1.47). Even on the type metric table with the unique subjective properties of the first type, a high score is given for "Because I use a smartphone for personal life and work, I am experiencing a change in my lifestyle" (#13, z = 1.40). In brief, business coworker users are basically people who aim for mobile smart work and recognize smartphones as a "fellow worker" which supports quick and effective business management.

4.1.2. The skillful enthusiast (T2)

In one word, the second type of users is the smartphone "enthusiast". They use smartphones freely according to their own tastes (pursuit of benefits). Most P samples of this type directly purchased their smartphones owing to their functions, quality, services, and design. Even today, they are still highly engaged in using smartphones. Compared to other types, people of this type are experts in increasing the usability of a smartphone according to their personality. For the second type of users, the smartphone must have a sophisticated design, a good touch sense, an interface (#11, z = 1.02), and it must be practical, such as having a quick response speed, good system quality, and good compatibility (#7, z = 1.39). This second type of users are actively interested in new applications and new technology information services such as LBS/GPS and AR (#24, z = 1.06). The standard scores of Q (7) and Q (24) were found to be high, with z7 = 0.624 and z24 = 0.624, respectively. The user type considers practical benefit as important and is most sensitive to financial considerations, such as device price and data charges. They think economic benefits come from smart use of smartphones (#5, z = 1.85).

Smartphone functions mostly used by this type of users are 'Internet in the hand' (#25, z = 1.63) and multi-tasking functions. Specifically, multi-tasking is appealing to people who instantly understand the smartphone user manual and can use it freely according to their personalities (#23, z = 1.06). Respondents of the second type are much quicker when it comes to understanding the use, menu structure, and interfaces of smartphones. They stated that it was not difficult to handle a considerable number of applications because they have their own ways of use and know-how. For example, they are people who can maximize various functions of a smartphone, such as using a morning alarm, map-search function during travel, listening to music, using an application or watching a video in private, and using e-mails, memos, and scheduling while working. In brief, the second user type has a tendency to be an innovator or an early-adapter. They are remarkable at understanding and handling new technologies. The result of the type metric table illustrates this fact. Their satisfaction increases when they are provided with a smart platform, application, content type, and/or service equipped with new AR, QR code, mash-up, or rich media technology. This research classifies the second type as "skillful enthusiast" users and defines them as benefit-oriented smartphone devotees who use smartphones freely based on their personal attitudes, tastes, and purposes.

4.1.3. The new experience seeker (T3)

The third type of user places great emphasis on new experiences through the use of a smartphone. These are early-adapter users with experiential knowledge and usability about smartphones and primary users who recently joined the group of smartphone users. Their common point is that they enjoy the experiential value from a smartphone "at that time". The third type stated that the hedonic value of experiencing a completely new world by using a smartphone peaked and they feel as if they stepped into an enormous new world (#35, z = 1.05). In fact, these people are hooked on downloading and using unlimited applications or content types, or they like to share information actively in smartphone user communities or with friends (#39, z = 1.03). One outstanding property is the apparent difference between Q (35) and Q (39), with z35 = 1.307 and z39 = 1.118, respectively.

An instructive property of smartphones that the third type recognizes comes from the change in their lifestyle before and after the use of smartphones. Because it is possible to combine e-books, a diary, documents, and scheduling into one smartphone, the third type of users can realize a lifestyle that is simpler than it was in the past. Specifically, they consider the experiential value associated with smartphones as important, and share their experiences with smartphones and their services with other people. To do this, they engage in real-time communications with acquaintances and actively participate in building communities in which they interactively share information with (#21, z = 1.29). Compared to the other types, there are many people in this group who experience addiction symptoms concerning their smartphones. For example, if they forgot to bring their smartphones on them or if they are broken or lost, they panic or feel as though they have lost a friend. As personal information is saved on their mobile devices due to their high usage of experiential functions, they pay careful attention to prevent the smartphone from being damaged (#17, z = 1.61). In this study, the purpose of smartphones for this type is as "a life partner providing experiential value in a new life". They are thus termed "new experience seekers".

4.1.4. The close buddy (T4)

The fourth type of users treats their smartphone as their "buddies". Sometimes the smartphone is their favorite friend, or sometimes it is a fun toy with which to spend what would otherwise be a mundane period. For them, the best aspects of a smartphone are any-time-search function (#24, z = 1.42), infotainment types of games, and real-time communication platforms. Moreover, they constantly smartphones in various ways, from a location-based map search, mobile web surfing, and e-mail (#18, z = 1.14) as well as e-books, games, and social applications. They are open-minded users and similar to the second type of users, who pursue multi-tasking in some ways. However, when we closely look at the interview results for the Q-sorted respondents, there is a special attribute to the fourth user type. As shown in the results of the type metric table, they concentrate on services provided when "traveling".

The most-appealing aspect of a smartphone is that it is possible to have fun "24 h and within 30 cm", as with a close friend. Also, they find it more convenient and better to use a smartphone that combines what used to be done with desktop computers, laptops, and PDAs all together (#9, z = 1.60). Moreover, the standard score (z = 2.320) of Q (9) showed a higher value than any other type for this metric. This type of users' scores ranks movable ones higher than stationary media such as TVs or PCs. Another good aspect of a smartphone is its real-time information-sharing feature through SNS or mobile instant messaging with friends or acquaintances. However, it is not convenient to use smartphones constantly owing to their compact size.

This type of users considers smartphones as their friends, with which they can study, watch a movie, have a conversation, shop, and take with them when they travel. They enjoy a variety of uses with it, such as education, work, amusement, and transportation-related functions. They always have their smartphone whenever it may be needed. Therefore, the range of usage depends on how they manage and use it according to their personalities and usage purpose. Eventually, the fourth user type considers a smartphone as "a friend who shares enjoyment and amusement whenever I need it". They are termed here as the "close buddy type".

4.2. Exploring in-depth consumer behavioral features

4.2.1. Demographical characteristics of each type

To determine differences among the four types in terms of gender, age, educational background, and household income, a frequency and descriptive statistics analysis was performed. Table 7 shows the distribution by type, showing T4 (46.1%), T1 (26.8%), T2 (15.1%), and T3 (12.0%). In terms of gender, it was found that most males belonged to T2, at 66.0% whereas the lowest distribution (34.0%) was shown for females of this type. Females had the highest distribution for T4, at 47.9%.

In terms of age, most of those in their 20s were found to be in T3 (52.6%); most of those in their 30s were in T2 and T4 (44.7% and 51.4%); and most of those in their 40s were in T1 and T4 (27.9%, 41.8%). Specifically, the distribution for those in their 30s was evenly distributed. Thus, it can be ascertained that users' individual characteristics are comparatively pronounced. In terms of educational background, people with an undergraduate degree were mostly in T3 and T4 (73.7%, 67.8%); however, people with a post-graduate degree were very likely to be in T1 (44.2%). Thus, as the level of education increases, a higher propensity to be in T1 was noted.

In terms of household monthly income, T1 had the highest level, at >$435(34.9%); T2 was at <$206(29.8%), T3 was at <$435(15.8%), and T4 was at <$175(34.9%) and <$260(30.8%). Thus, as the income level increases, those in T1 increased comparatively while those in T4 decreased. As the income level

Table 7
Defining Characteristics of Each Type with Q-tool.

Definition of Four Types	f	%
T1 'The Business Partner' I use a smartphone in my personal life and at work effectively. The 'Internet in my hand' function allows better productivity through instant e-mailing, messenger communication, scheduling, and notes management; therefore, it is a good business partner. I frequently use it for business, as I always carry it with me.	85	26.8
T2 'The Skillful Enthusiast' I am a smartphone enthusiast and am immersed in it. A sophisticated design, a good sense of touch, and a good interface are appealing. It should also be very practical. I can freely use applications, content, and services depending on my own taste and situations. If necessary, I am usually able to use new technology without any discomfort.	48	15.1
T3 'The New Experience Seeker' I felt like I entered a new world as I started using Smartphone. Newly updated applications or services provide me interesting and various experiential values. As I become familiar with the smartphone I feel changes in my lifestyle, and the smartphone eventually became my life partner. I feel empty if it is out of my hand.	38	12.0
T4 'The Close Buddy' To me, a smartphone is sometimes like a friend who is always with me, or sometimes a toy with which to spend time. Anytime I need it or when I travel I freely access the network and use various types of amusements, such as searching for new information, playing games, doing work, or socializing. I usually do not make a distinction among the functions of a smartphone.	146	46.1

Table 8
Frequency analysis of smartphone usage pattern by four types (Hybrid Q-R).

User types	The business partner (T1)		The skillful enthusiast (T2)		The new experience seeker		The close buddy		Total	
	f	%	f	%	f	%	f	%	f	%
1. Period of use (unit: month)										
Under 5	22	25.6	10	21.3	12	31.6	41	28.1	85	26.8
5–10	25	29.1	17	36.2	13	34.2	63	43.2	118	37.2
11–15	27	31.4	9	19.1	11	28.9	22	15.1	69	21.8
16–20	4	4.7	5	10.6	2	5.3	10	6.8	21	6.6
21–25	5	5.8	5	10.6	0	0.0	7	4.8	17	5.4
26–30	1	1.2	0	0.0	0	0.0	1	0.7	2	0.6
31–35	2	2.3	1	2.1	0	0.0	0	0.0	3	0.9
36 and over	0	0.0	0	0.0	0	0.0	2	1.4	2	0.6
2. Per day using										
0.5–1	4	4.7	4	8.5	4	10.5	26	17.8	38	12.0
2–3	42	48.8	20	42.6	18	47.4	55	37.7	135	42.6
4–5	16	18.6	8	17.0	7	18.4	29	19.9	60	18.9
6–7	12	14.0	2	4.3	2	5.3	12	8.2	28	8.8
8–10	5	5.8	4	8.5	2	5.3	14	9.6	25	7.9
11–15	5	5.8	7	14.9	3	7.9	5	3.4	20	6.3
16–20	2	2.3	0	0.0	2	5.3	3	2.1	7	2.2
20 and over	0	0.0	2	4.3	0	0.0	2	1.4	4	1.3
3. Monthly rates										
Under 30$	5	5.8	1	2.1	1	2.6	0	0.0	7	2.2
$30 \leq x \leq 39$$	23	26.7	7	14.9	15	39.5	48	32.9	93	29.3
$39 < x \leq 48$$	41	47.7	18	38.3	16	42.1	70	47.9	145	45.7
$39 < x \leq 48$$	4	4.7	3	6.4	4	10.5	16	11.0	27	8.5
$48 < x \leq 65$$	4	4.7	2	4.3	0	0.0	0	0.0	6	1.9
$65 < x \leq 74$$	1	1.2	4	8.5	1	2.6	3	2.1	9	2.8
$74 < x \leq 87$$	8	9.3	5	10.6	1	2.6	8	5.5	22	6.9
Discount rate	0	0.0	7	14.9	0	0.0	1	0.7	8	2.5
4. The number of downloading Apps per month										
Under 3	30	34.9	12	25.5	4	10.5	34	23.3	80	25.2
3–5	19	22.1	18	38.3	15	39.5	60	41.1	112	35.3
6–10	31	36.0	7	14.9	10	26.3	31	21.2	79	24.9
11–15	2	2.3	4	8.5	1	2.6	5	3.4	12	3.8
16–20	3	3.5	5	10.6	1	2.6	7	4.8	16	5.0
21–25	0	0.0	1	2.1	0	0.0	1	0.7	2	0.6
26–30	0	0.0	0	0.0	4	10.5	3	2.1	7	2.2
31 and over	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

decreases, the results for T4 were remarkable. These results should prove useful preliminary data in planning advertisement marketing strategies.

4.2.2. Smartphone usage patterns of each type

This study conducted a comparative analysis of the usage patterns for smartphones, e.g., the usage period, average daily use duration, average monthly fee, and number of applications downloaded. Users who have used smartphones between five and ten months were dominant. Table 8 shows the statistical distribution of the period of use. Types of 'The Business Partner (T1)', 'The Skilled Enthusiast' (T2), and 'The Close Buddy' (T4) are spending relatively long hours through smartphone, compared to the type of 'The New Experience Seeker' (T3). The results imply that as smartphone is more common in everyday life, as with former three types, the learning effect and skills of user advances. The smartphone was a bit strange at first but it is getting used to users in their daily life. Eventually, it will provide mostly more and more benefits and opportunities to expose them to various mobile advertisements and enhance their work-life productivity.

In addition, 2 to 3 h of use per day was most common. Generally, up to 2 to 3 h of usage for all users was dominant, and more than 8 to 10 h daily of use became more remarkable with the T2 and T4 including respondents using for more than twenty hours. Monthly average service fee was reported the greatest cost spending by the type of T2 with experience in handling their own smartphone for all sorts of things. Relatively, T3 users used cheap rate system. The aforementioned results of the Q study revealed that they use this 'smart' device "for a very limited purpose". Finally, in frequency analysis of preferred application downloads, 'The New Enthusiast' T3 users distinguished themselves among all types including users download above twenty-six applications per month, while the frequency of T1, T2 and T4 is much lower than T3.

4.2.3. Correlation analysis of demographic attributes

To investigate the statistical significance of demographic variable differences among the types defined, a cross-comparison analysis and a one-way variance analysis were performed. In these analyses, age, gender, and educational background variables were nominal and therefore, cross-comparison analysis method, and nonparametric statistical measure were performed, between questions, for these variables. The correlation between the chi-square, χ^2, and the results of a variable statistical significance test were assessed. The result of the cross-tabulation analysis for the nominal variables showed that $p = 0.001(<0.05)$ at $\chi^2(32.708)$ and therefore, the null hypothesis was rejected at a significance level of 95%.

There exists a difference between the four types depending on the age variable. In order to verify a concrete correlation, Cramer's V (Phi; the square of the chi-squared statistic divided by the sample size) – broadly used in statistical analyses of nominal data – was used. The correlation diagram for age and each type confirms the correlation between the two variables, as $p = 0.001(<0.05)$ and Cramer's $V = 0.183$.

The Table 9 below shows the cross-distribution of each type per age group: teenagers belong to the third type (50%) and the fourth type (50%) mostly while those in their twenties and thirties are distributed as follows: fourth type (54%, 46%), first type (13%, 26.5%), second type (14.4%, 15.9%), and third type (13.7%, 11.4%). People in their forties are mostly in the first type (55.8%), followed by the fourth type (20.9%), the second type (16.3%), and the third type (7.0%). Moreover, the values for gender ($\chi^2 = 5.931$, d.f. = 3, $p = 0.115$) and educational background ($\chi^2 = 15.094$, d.f. = 9, $p = 0.088$) showed a result of $p > 0.05$ and were not therefore statistically significant. In other words, the influence of the gender and educational background variables was not statistically meaningful in terms of denoting a difference between each type.

Table 9
Correlation analysis by age.

Types	T1		T2		T3		T4		Total	
	f	%	f	%	f	%	f	%	f	%
10s	0	0	0	0	1	50.0	1	50.0	2	0.6
20s	25	18.0	20	14.4	19	13.7	75	54.0	139	43.8
30s	35	26.5	21	15.9	15	11.4	61	46.2	132	41.7
40s	24	55.8	7	16.3	3	7.0	9	20.9	43	13.6
50s	1	100	0	0	0	0	0	0	1	0.3
Total	85	26.8	48	15.1	38	12.0	146	46.1	317	100

5. Discussion and conclusion

This research – as a customer relationship management method reflecting proper point of contact with consumers for advertising entrepreneurs who pursue effective marketing strategies for smart mobile advertisement – designed a theoretical consumer typology framework. Through Q research, the subjectivity of smartphone users as advertisement consumers was analyzed and different properties of the four types of "The Business partner", "The Skillful enthusiast", "The New experience seeker", and "The Close buddy" users were discovered and theorized. Moreover, a Q–R tool for quantitative research to verify the actual distribution of the discovered types and differences in their characteristics was developed for use with survey investigation.

To interpret and define in-depth the typological features of each consumer group, this research additionally referred and investigated more detailed consumer behavioral criteria about tendency of smartphone usage pattern as shown in the Fig. 2 and lifestyle referred in the Fig. 3. The additional results of this study will improve useful industrial contributions in the business and marketing field of new media advertising as well as academic in the future. Firstly, measurable variables about users' usage patterns include use purpose of smartphone, personal advertisement preference, and motivation of buying smartphone, and the variables of consumer lifestyle consisted of users' activity space, friendly transportation, their job, and the degree of word of mouth effect.

The first type showed the highest distribution in the interior workplace, in their cars, and for a specialist/researcher/management/service purpose. The second type showed a house/outdoor workplace, bus/subway (public transportation), and teacher/company worker/researcher usage pattern. The third type showed a school/during travel, bus/on the street, and company worker/student/public official usage pattern, and the fourth type showed a house/school, subway, and student/specialist/unemployed usage pattern. As a response to the word

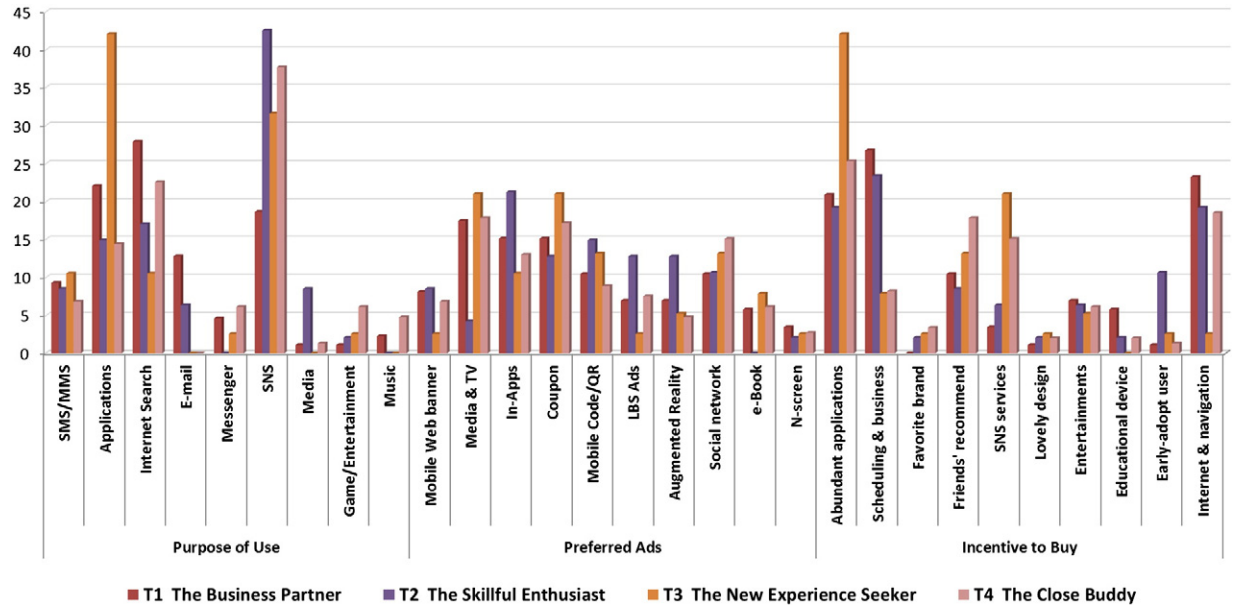

Fig. 3. Consumer behavioral attributes and pattern about smartphone use.

of mouth effect, for around 1–3 people, the viral effect of the fourth type was found to be high. However, the most loyal word-of-mouth marketers are the third user type, who shares new experience with acquaintances through their smartphones.

The purpose of smartphone usage for the first type is as a means of business, such as searching the Internet, using SMS/MMS, messaging, and using e-mails, thus well representing the property of the first type as discovered in Q. However, the second type of user uses a smartphone for SNS and media (streaming video) whereas for the third type of users, who place a high value on a new experience, frequently use applications and SMS/MMS. The fourth type users, who consider their smartphone as a friend, were found to have a high level of interests in music, entertainment, games, and messaging. The results of advertising-type preferences for users – who could prove practical and preliminary data for smart mobile advertising marketing – are as follows. The preferences of the first type of user are mobile web banners and n-screen advertisements; the second type favors in-app ads, QR code, LBS, and AR advertisements; the third type opts for media/TV, advanced coupon advertisements, and e-book advertisements; and the fourth type is inclined for SNS, media, and evolutional coupon advertisements.

The first type of users uses smartphones personally or for business, and they are mostly in their 30s or 40s. This group includes both males and females who are highly educated, with household monthly income greater than $350. The proper advertising strategy for them is stress mobile web searches with the "Internet in my hand" or banner-like advertisements and n-screen ads, depending on the users' situations such as when traveling in a car or in their offices. The second type of users likes smartphones' appealing points, and they look for practical values. They are mostly in their 20s and 30s, mostly male, and have comparatively even distributions of educational levels and household income. They use applications, contents, and services freely according to their own tastes and situations, are able to operate new technologies, and are interested in mash-up advertisements such as in-app ads, QR, and AR. An advertisement that can provide various experiential levels of value and economic usage modes at the same time is appropriate. A combined advertisement offering new technology, incentives and coupons should be highly successful [18].

The third type of user is interested in new experiences offered by smartphones. These users are mostly in their 20s, and the other variables had little relevance. They use mobile videos or download applications, and their usage levels are higher than those by the other types. They are also highly communicative with others. Also, the Q research results revealed that they have a high level of interests in media streaming, advanced coupons and e-book advertisements as noted in preferences for the R research results. They are the user most sensitive to mobile campaigns using collective intelligence or viral advertisements. Therefore, interactive advertisements that match their communication styles along with social advertisements and mobile rich-media advertisement will be effective. Moreover, these users think it is ideal to encounter advertised products having good evaluations or receive recommendations from trustworthy people. Therefore, a strategy that minimizes risk by increasing the number of acquaintances and applying "funnel theory" is deemed. Lastly, the fourth type of users considers smartphones as friends. They stay connected to the network at all times when traveling. They are mostly in their 30s or older, with incomes of less than $260. Their gender and level of education had little effect on the outcomes. The fourth type prefers SNS, media, and evolutional coupon advertisements and smartphones at all times. Therefore, they are advertisement

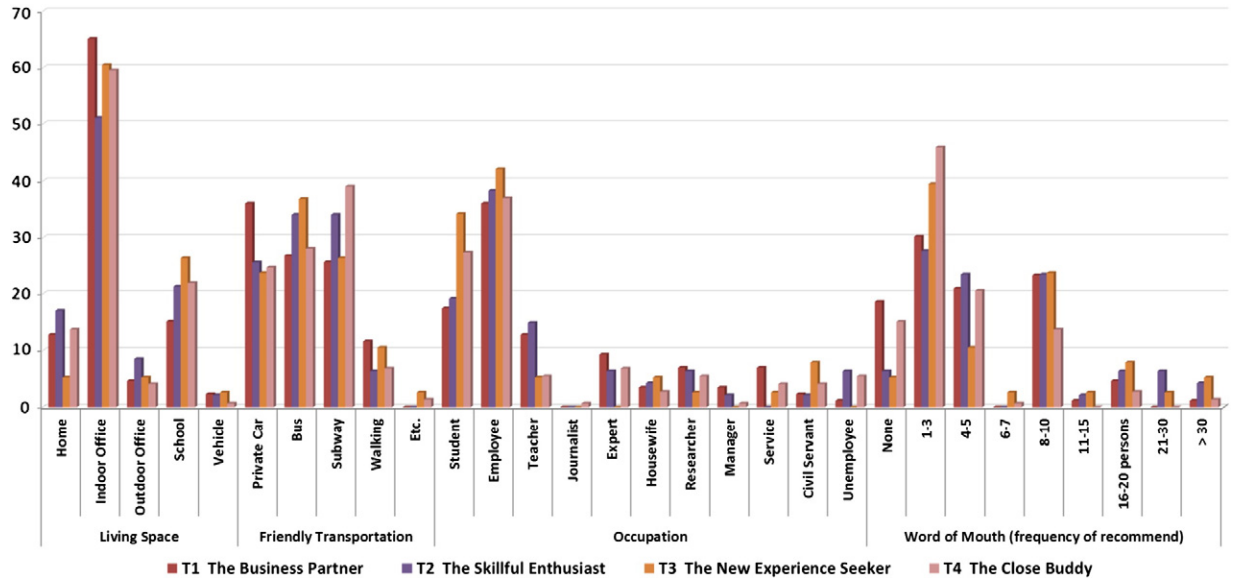

Fig. 4. Consumer lifestyle attributes.

consumers who will be interested in real-time context advertisements delivered through the means of GPS or LBS, or SNS social advertisements [24].

As discussed up to this point, for the properties of the four smart mobile-advertising user types discovered through a qualitative Q research, a survey based on R research was performed for more detailed and encompassing interpretation. This research designed a relational diagram on advertising marketing positioning for each user type as seen in Fig. 5. Based on research in Figs. 3 and 4, advertising content for which each type prefers the most and the least relative to the other types was derived and positioned as "preferred advertising" and "not-preferred advertising." By doing so, differences among the consumer market segmented into four at this point, and desirable marketing direction and insights (or guidance) for each consumer cluster were proposed.

Consumers in the first type, "The Business partners", showed a relatively high level of interests on advertising that linked smartphones to smart TVs — cross-media type advertising (so-called "n-screen") or conventional mobile web banner advertising. For the second type, they exhibited pronounced preferences for in-apps, QR or AR, and LBS-based map-type advertising. For the third type, streaming media or TV with "hedonic" contents, e-book, and diverse coupon types would be appropriate. The fourth type users that "always have smartphones on them" are most favorably inclined toward SNS advertising and as such, an advertising strategy of coupons, LBS or maps, and cross-media that have

Consumer Segmentation	Preferred Ads		Not Preferred Ads
I. The Business Partner	Cross media(n-screen) ads Mobile web banner ads	⇢	Social network(SNS) ads (IV type)
II. The Skilled Enthusiast	In-apps ads QR or AR ads LBS or map ads Mobile web banner ads	⇢	Streaming media ads E-book ads Coupon ads (III type)
III. The New Experience Seeker	Coupon ads Streaming media ads E-book ads	⇢	Mobile web banner ads LBS or map ads In-apps ads (I or II type)
IV. The Close Buddy	Social network(SNS) ads Coupon ads LBS or map ads Cross media(n-screen) ads	⇢	QR or AR ads (II type)

Fig. 5. Strategic marketing positioning targeting four consumer segments.

the highest usability in everyday life would be appropriate. The first type, especially, tended to avoid advertisements as opposed to the fourth or third type that was favorably disposed toward it. And the second type was revealed to show advertising tendencies that contrasted against those by the third type. Lastly, while the fourth type, in general, is highly interested in a variety of advertising. But in comparison to the second type, the fourth type responded only when economic and practical values were imbued on advertising content.

Through smart mobile advertisement platforms, active consumers will actively look for their desired advertised products and services. Today, "smart" is a core keyword in mobile business and is connected to both marketing and culture. Therefore, this research proposed a theoretical outline and strategic guidelines by synthetically analyzing users' psychological tendencies and lifestyles through their behavior and preferences via a mixed research method in providing an angle for mobile advertisement marketing research. The results of this study have not only academic but also industrial values. With this research as a starting point, future consumer-type studies involving various smart devices can be performed to expand mobile advertisement consumer segmentation and market segmentation research.

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