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## Mobile information services marketing to serve the BOP market

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### Abstract

Wireless technologies have created an unprecedented opportunity for direct marketing to communicate with customers in an instantaneous, interactive and customized way. At present the number of mobile customers in the world have already exceeded 3 billion and among them two third of the customers are coming from the developing countries where there is high growth of mobile penetration and mobile service consumption. Our study has focused on this developing segment to market mobile information services to the unconnected and deprived customers to solve their problems at the robust pace. The paper has recommended some basic information needs as well as some quality factors and regulatory issues which are significant to customers and influence the flow of this information value chain.

### Keywords

services, information, mobile, serve, market, marketing, bop

### Disciplines

Business | Social and Behavioral Sciences

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## Mobile Information Services Marketing to Serve the BOP Market

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### Abstract

*Wireless technologies have created an unprecedented opportunity for direct marketing to communicate with customers in an instantaneous, interactive and customized way. At present the number of mobile customers in the world have already exceeded 3 billion and among them two third of the customers are coming from the developing countries where there is high growth of mobile penetration and mobile service consumption. Our study has focused on this developing segment to market mobile information services to the unconnected and deprived customers to solve their problems at the robust pace. The paper has recommended some basic information needs as well as some quality factors and regulatory issues which are significant to customers and influence the flow of this information value chain.*

**Keywords:** information needs assessment, quality of service parameter, functional quality, and technical quality

### 1. Introduction

Information is power. And it is such a power that can open up the windows of opportunities for a person as well as for a nation. For emerging economies, the industry of information and communication technology can create tremendous opportunities to catch up with the richer ones. And in this regard, Mobile information services can play the vital role of connecting rural customers irrespective of time and place and empowering customers with the right time information through their fingertips. A recent study by London

Business School found that, in a typical developing country, a rise of ten mobile phones per 100 people boosts GDP growth by 0.6 percentage points [1]. If we consider the total consumers of the world under economic pyramid, then there are approximately four billion consumers at the very ‘Bottom of the Economic Pyramid’ (BOP) with low disposable incomes and experiencing either non-consumption or under consumption of many products and services [2]. Although they have a per capita incomes of less than \$1,500[2] but most of them are within the coverage of mobile networks. So if we focus on this large market with ubiquitous information and “If we stop thinking of the poor as victims of as a burden and start recognizing them as resilient and creative entrepreneurs and value –conscious consumers, a whole new world of opportunity will open up”[3]. Our study focuses on Bangladesh, which is one of the fastest growing mobile markets in the world with 21.76 million subscribers with about 10% penetration and 135% annual growth [4]. It is one of the BOP (bottom of the economic pyramid) markets with \$520 annual per capita income, which is less than \$2 per day [5]. In our study, we have assessed the information needs of this market along with all the related variables to develop an integrated information services marketing model which can give an overall picture of ubiquitous information services to the community. As of now most of the research on mobile services has been done on qualitative basis. Although there are some empirical research, but most of them focus on regional comparison of mobile services or satisfaction of customers toward those services. The uniqueness of this paper lies in its sole focus on ‘mobile information services’ and its significance to the ‘BOP market’. The purpose of this research is to determine the factors that influence the marketing of mobile

information services in the BOP market with the following specific objectives:

- a. To determine the quality of information services that will trigger its adoption;
- b. To determine the variety of information needs to the BOP market;
- c. To determine the regulatory issues which also influence the marketing of information.

## 2. Methodology

We have initially applied exploratory research design (focus group discussion and depth interview) to bring out all the related variables (information quality, social factors and regulatory issues) that affect consumption of mobile information services in the BOP market of Bangladesh. Depending on the exploratory findings, we have developed the analytical model on four issues (information needs assessment, functional quality, technical quality and regulatory issues). For regulatory issues, we have made our qualitative analysis on depth interview due to small number of sample elements. But for the rest of the issues, we have prepared the relevant research questions and pertinent hypotheses for quantitative analysis. The formulated hypotheses have led us to develop the structured questionnaire using 5 points likert scale (where, 1 = “Strongly disagree”, 2 = “Disagree”, 3 = “Neutral”, 4 = “Agree”, 5 = “Strongly agree”). Then we have used the questionnaire under stratified random sampling technique for data collection regarding consumer information requirements and functional quality of information. We have selected those sample elements who reside in rural settings, having daily income of less than \$2 and consume the mobile services more than twice a week. In this case, we have collected data from 125 sample elements out of five different geographic regions in which the valid response rate was 80%; so finally it turned out into 100 sample elements for data analysis. To test the hypotheses regarding technical qualities of information, we have collected data from 30 technical people who are serving the mobile phone industry and in this case the response rate was 100%. For data analysis, initially, we have applied descriptive statistics to evaluate the average response rates by using mean values. Therefore, we have conducted factor analysis to develop the significant factors on all the interrelated variables. Here we have applied principal components method using varimax rotation [6]. For the sake of convergent validity, 0.4 was used as a factor loading cut-off point and factors including less than three items were eliminated [7].

## 3. Literature Review

The mobile marketing association (MMA) defines mobile marketing, as “Mobile Marketing is the use of the mobile medium as a communications and entertainment channel between a brand and an end-user. Mobile marketing is the only personal channel enabling spontaneous, direct, interactive and/or targeted communications, any time, any place.” [8]. Mobile marketing is one of the components of direct marketing which share some distinctive characteristics to make it different from others. This medium is non-public as the message is normally addressed to a specific person, it is customized as the message can be prepared to appeal to a particular individual, it is up-to-date as the message can be prepared very quickly and finally it is interactive as the message can be changed depending on the person’s response. At present, mobile marketing channel has been mainly used in promotion such as in competition and in lotteries [9]. However, the market seems to be ready for information marketing through establishing a network of collaborative information providers. Information can be produced and marketed as a product [10]. The production, packaging and distribution of information are one of our society’s major industries [11]. With the advent of mobile technology, the marketing of information services has got a new rhythm. Moreover, the main reasons underlying the high expectation laid to mobile channel refer to its high reach, low cost and high retention rates [12]. Additionally, the mobile channel, especially SMS is seen as immediate, automated, reliable, personal, discreet, and providing mobile phone users a direct call to action that would via other channel be almost impossible [13].

For rural customers, this channel can act as a dynamic platform to fight against poverty by serving the community as an umbrella of information. The 20 biggest emerging economies include more than 700 million households, with a total annual income estimated at some \$1.7 trillion [2]. But the success of mobile network operators (MNOs) in penetrating these low-income customers has been very disappointing. Most companies choose to focus on the middle and upper income segments of the developing world because of non-existent distribution channels, illiteracy, poverty, and sometimes even war or violent insurgencies can stifle the enthusiasm of companies in serving people living in poverty. Underlying these reasons is an assumption that the poor cannot be targeted for a profitable and attractive market segment. Indeed, most MNOs have elected to ignore these consumer segments and focus on the ‘low hanging fruit – customers in the middle and upper income brackets. But there are some burning examples in some parts of the world where

these customers have been served profitably and which eventually turned them into change agents by connecting the society under one umbrella by effectively ensuring the 4As – availability, affordability, awareness and acceptability. This new channel of communication allows villagers to learn the fair value of their rice and vegetables, cutting out middlemen notorious for exploiting them. They can arrange bank transfers or consult doctors in distant cities (2).

Since most of the rural customers in the developing countries are disconnected from modern communication vehicles (TV, Internet or daily newspapers), the mobile communication channel can empower customers with right time information to solve all their problems at the robust pace. “...In the developing world, things are very different. Mobile phones are increasingly recognized as powerful tools in the fight against poverty, since they reduce transaction costs, facilitate entrepreneurship and substitute for slow, unreliable transport and postal systems [14].”

Marketing of information largely depends on its ‘quality’, which can be categorized into technical and functional quality. Technical quality refers to the network performance of the operators which include

bandwidth and network coverage [15], network congestion [16], call dropping probability [17], voice quality [18], database availability and reliability [19], data transfer delay [20], Network security [21], jitter or variation in response time, data loss rate [22], software reliability [23], reliability of data transfer [24] and efficient service restoration [25]. On the other hand, functional quality refers to the reliability, responsiveness, access, communication, competence, understanding and security of information [26], currency, error & accuracy and specificity of information [6], customization [27], ease of use [28], affordability, availability, access and awareness [3]. In addition to information quality, social factors and regulatory issues also influence the flow of information marketing over the ubiquitous platform.

Above all, to serve the BOP market with right time information, mobile operators need to align IT and business to create enterprise data models and information architectures[29]. Organizations need to conduct these activities holistically and within the context of overall information — not just data folks concentrating on data and content experts concentrating on unstructured information.

#### 4. Model Development on Mobile Information Services Marketing

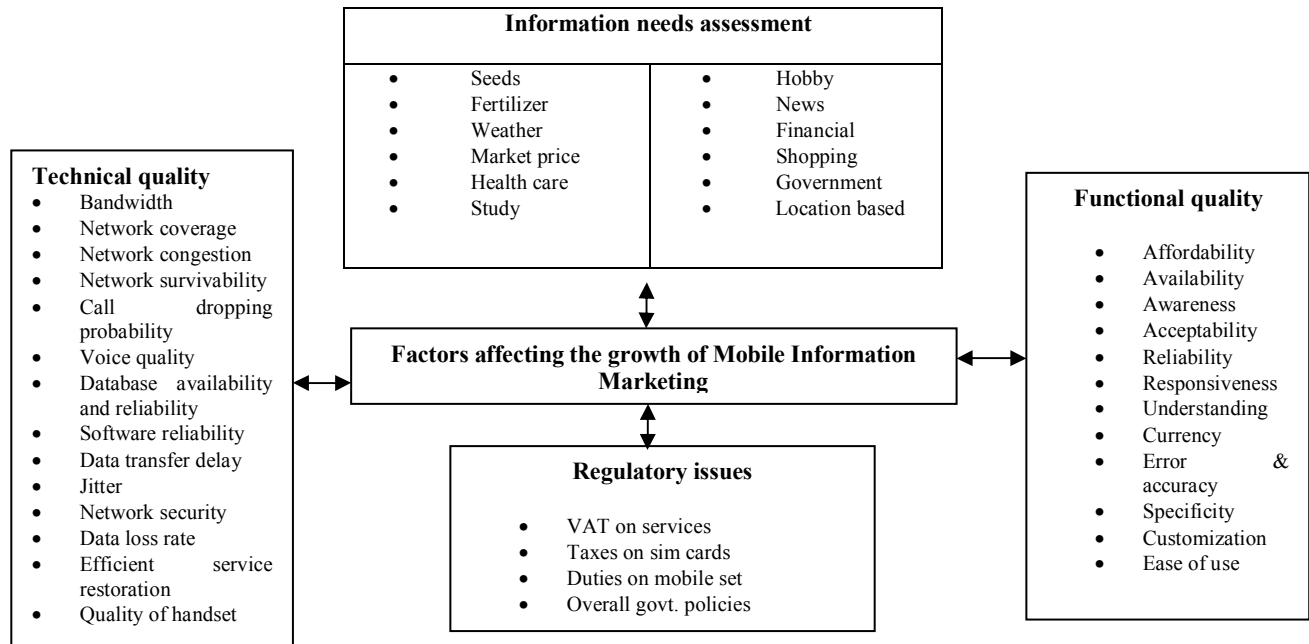


Figure1. Model Conceptualization

The model conceptualizes and articulates all the relevant variables regarding information needs assessment, the qualities of information and regulatory issues which affect the flow of information to the BOP market. The uniqueness of the model lies in its integration of all the related variables, which influence the information value chain in our target market. On the one hand, the technical quality of information influences the process of information flow and on the other hand, the functional attributes play an important role to satisfy customers' needs. Moreover, the ultimate acceptability of this service depends on customers' willingness toward particular type of information which range from farming, market price, health, and education to shopping, financial, location based information. Above all, the regulatory issues (e.g. taxes on mobile phones, sim-cards and mobile information services) also play a pivotal role to influence the marketing of information services through mobile channel. In this regard, Government can pave the way

to reach the benefits of this medium to the deprived and unconnected customers with either favourable policies or generous efforts through sharing the infrastructure with the mobile operators.

## 5. Empirical Findings

### 5.1. Descriptive Statistics

**5.1.1. Information needs assessment.** In case of information needs assessment, the descriptive statistics in Figure 2 clearly indicates that information regarding government issues (3.06) and hobby (3.01) are not so much important to the rural customers like other information. Since most of the customers in the BOP market are very much concerned with their livelihood; so information regarding hobby, amusement or regulatory issues are not significant to them.

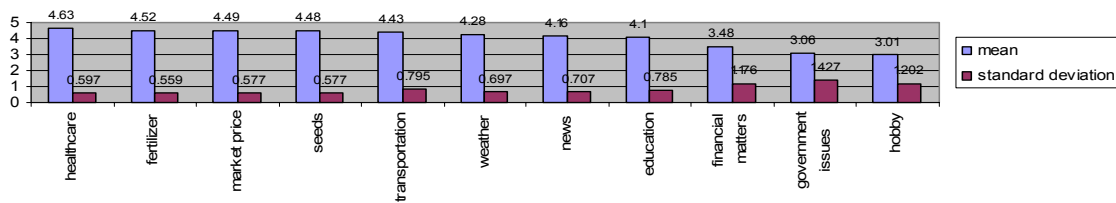


Figure 2. Information Needs Assessments

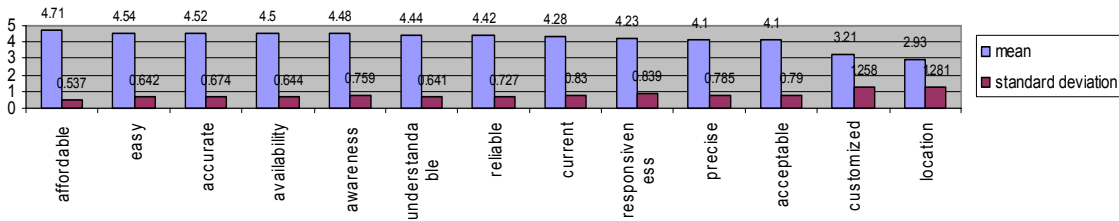


Figure 3. Functional Quality of Information

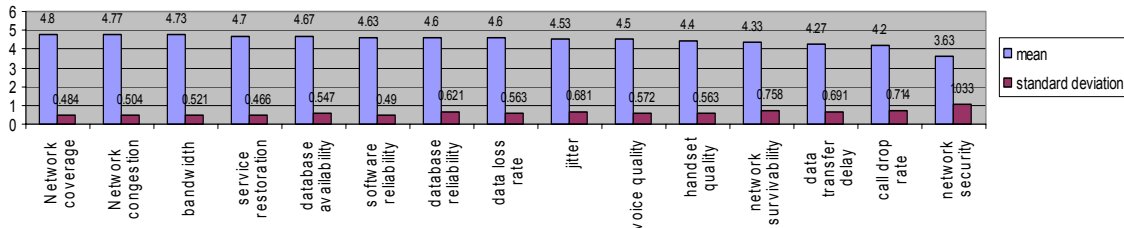


Figure 4. Technical Quality of Information

**5.1.2. Functional quality of information.** For functional quality, we focus on descriptive statistics in Figure 3, which clearly shows that customized information (3.21) and location based information (2.93) have got the lowest ratings.

**5.1.3. Technical quality of information.** For Technical quality, if we look at the descriptive statistics in Figure 4, it is quite evident that most of the variables got relatively higher ratings. So it means that all the technical qualities are very important to the operators for the effective delivery of information to the customers at t means that all the technical qualities are very important to the operators for the effective delivery of information to the customers at the BOP market.

## 5.2. Results of Factor Analysis

The results of factor analysis were summarized in Table 1 for the three relevant variables of information needs assessment, the qualities of information and regulatory issues

**5.2.1. Information needs assessment.** We have conducted factor analysis over the variables of Information needs assessment and we have extracted 3 factors which explain 70.84% cumulative variance (see Table 4.2). The overall factor analysis is significant as the KMO statistics is greater than .50 and the chi square statistics is significant as the probability is less than 0.05. (See Table 4.1). We have categorized 3 factors in which the first factor is **information about necessity** which explains 33.87% variance and includes variables

regarding information on seeds(.961), fertilizer(.924), market price(.959) and education(.674). The second factor is **information about connectivity** which explains 19.37% variance and includes variables regarding information on weather (.881), health care (.770) and news (.883). The third factor is **information about administrative issues** which explains 17.60% variance and includes variables regarding information on finance (.845), governmental issues (.818) and hobby (.710).

**5.2.2. Functional quality of information.** We have also conducted factor analysis over the functional quality of Information. We have extracted 3 factors which explain 61.92 % cumulative variance (see Table 5.2). The overall factor analysis is significant as the KMO statistics is greater than .50 and the chi square statistics as the probability is less than 0.05. (See Table 5.1). We have categorized 3 factors in which the first factor is **simple & affordable information** which explains 29.95 % variance and includes variables on affordability(.878), awareness(.869), currency(.841) and accuracy(.741). The second factor is **easy& available information** which explains 17.945% variance and includes variables on availability (.932), understandable (.902) and easy to use (.621). The third factor is **precise information** which explains 14.028 % variance and includes variables on preciseness (.451), customization (.689) and location specific (.707).

<b>Information needs assessment (70.8% variance)</b>	<b>Functional Quality of information (61.9%)</b>	<b>Technical quality of information (68.1%)</b>
Information about necessity (33.8%)	Simple & affordable (29.9 %)	Network dynamism (21.8 %)
Information about connectivity (19.3%)	Easy& available (17.9%)	service effectiveness ( 18.2 % )
Information about administrative issues (17.6%)	precise information (14 % )	Data delivery mechanism (15.1 %)
		Service recovery (1.8%)

**Table 1. Factor Analysis**

**5.2.3. Technical quality of information.** Finally we have conducted factor analysis over the Technical qualities of Information. In this case, we have extracted 4 factors, which explain 68.12 % cumulative variance (see Table 6.2). The validity of the overall factor analysis is significant as the chi square statistics is significant at the 0.05 level (See Table 6.1). We have categorized 4 factors in which the first factor is network *dynamism* which explains 21.84 % variance and includes variables on network coverage (.883), network congestion (.901), call drop rate (.834) and handset quality (.523). The second factor is *service effectiveness*, which explains 18.265 % variance and includes variables on database reliability (.604), software restoration (.938) and software reliability (.884). The third factor is *data delivery mechanism* which explains 15.148 % variance and the includes variables on bandwidth (.887), database availability (.929) and response time (.587) and the last factor is *service recovery* which explains 12.86% variance and includes variables on data loss rate(.902), voice quality (.720) and variation in response time(.522)

## 6. Guidelines to Information Marketing

For information services, information regarding agriculture and health care should get the priority for our target market. For functional quality of information, affordability (price), availability (placing), acceptability (attractive product), awareness (promotion), simplicity, preciseness and easy to use information can play a predominant role to market these services to customers. For technical quality of information, network dynamism, service effectiveness and data delivery mechanism should be given second thought for establishing competitive advantages in the market. And above all, for favorable regulatory policies, mobile marketers should promote the positive impact of wireless communication to the BOP market which can ensure sustainable development for the society.

## 7. Conclusion and Scope of Further Research

Mobile information services have shown greater enthusiasm among the BOP customers in Bangladesh. The market is quite ready to accept these information services, which has become evident in our analysis. The research has also clearly highlighted a strong need to integrate information needs assessment, functional and technical quality of information and regulatory issues as it is essential for the smooth flow of information value chain to the BOP market. Our study has established a platform to do further research on this arena which may

cover internal management issues, entrepreneurial factors and social dimensions that might influence the services delivery of this ubiquitous information delivery channel.

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## Appendices:

Table 4 1 **KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.692
Bartlett's Test of Sphericity	Approx. Chi-Square	875.100
	df	55
	Sig.	.000

Table 4.2 **Total Variance Explained**

Component	Initial Eigenvalues			Total Variance Explained			Total Variance Explained		
	Total	% of Variance	Cumulative	Total	% of Variance	Cumulative	Total	% of Variance	Cumulative
1	3.726	33.871	33.871	3.726	33.871	33.871	3.487	31.698	31.698
2	2.131	19.372	53.243	2.131	19.372	53.243	2.209	20.086	51.784
3	1.936	17.597	70.840	1.936	17.597	70.840	2.096	19.056	70.840
4	.935	8.501	79.342						
5	.757	6.886	86.227						
6	.522	4.744	90.971						
7	.494	4.491	95.461						
8	.299	2.714	98.175						
9	.109	.990	99.166						
10	.078	.713	99.879						
11	.013	.121	100.000						

Extraction Method: Principal Component Analysis.

Table 4.3 **Rotated Component Matrix<sup>a</sup>**

	Component		
	1	2	3
information about seeds	.961	.107	-.136
information about fertilizer	.924	.131	-.139
information about weather	.306	.881	.033
information about market price	.959	.095	-.125
information about healthcare	-.128	.770	-.029
information about financial matters	.091	-.044	.845
information about education	.674	-.038	.232
information about news	.074	.883	.020
information about transportation	.291	-.074	-.316
information about governmental issues	.089	-.065	.818
information about hobby	-.347	.098	.710

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table 5.1 **KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.581
Bartlett's Test of Sphericity	Approx. Chi-Square	774.178
	df	78
	Sig.	.000

Table 5.2 Total Variance Explained

Component	Initial Eigenvalues			Total Sums of Squared Loadings			Initial Sums of Squared Loadings		
	Total	of Variance	Percentage of Variance	Total	of Variance	Percentage of Variance	Total	of Variance	Percentage of Variance
1	3.894	29.956	29.956	3.894	29.956	29.956	3.721	28.622	28.622
2	2.333	17.945	17.945	2.333	17.945	17.945	2.498	19.215	17.945
3	1.824	14.028	14.028	1.824	14.028	14.028	1.832	14.092	11.929
4	1.562	12.017	12.017						
5	.995	7.651	7.651						
6	.686	5.278	5.278						
7	.463	3.561	3.561						
8	.397	3.055	3.055						
9	.261	2.010	2.010						
10	.201	1.547	1.547						
11	.190	1.458	1.458						
12	.134	1.032	1.032						
13	.060	.463	.463						

Extraction Method: Principal Component Analysis.

Table 5.3 Rotated Component Matrix<sup>a</sup>

	Component		
	1	2	3
affordability affects information adoption	.878	.008	-.082
availability affects information adoption	.008	.932	.170
awareness affects information adoption	.869	.031	-.191
acceptability affects information adoption	-.619	-.139	-.190
reliability of the provider affects information adoption	-.606	-.033	-.435
responsiveness of the provider affects information adoption	.001	-.055	-.596
attitude toward understandable information	-.074	.902	.015
attitude toward current information	.841	-.133	-.021
attitude toward accurate information	.741	.277	.002
attitude toward precise information	-.098	-.559	.451
attitude toward customized information	-.042	.004	.689
attitude toward location based information	.078	.003	.707
attitude toward easy to use information	.406	.621	.038

Extraction Method: Principal Component Analysis.  
Rotation Method: Varimax with Kaiser Normalization.  
a. Rotation converged in 4 iterations.

Table 6.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.559
Bartlett's Test of Sphericity	Approx. Chi-Square	281.546
	df	105
	Sig.	.000

Table 6.2 Total Variance Explained

Component	Initial Eigenvalues			Total Sums of Squared Loadings			Initial Sums of Squared Loadings		
	Total	of Variance	Percentage of Variance	Total	of Variance	Percentage of Variance	Total	of Variance	Percentage of Variance
1	3.276	21.843	21.843	3.276	21.843	21.843	3.222	21.482	21.482
2	2.740	18.265	18.265	2.740	18.265	18.265	2.557	17.045	17.045
3	2.272	15.148	15.148	2.272	15.148	15.148	2.252	15.011	15.011
4	1.930	12.866	12.866	1.930	12.866	12.866	2.188	14.584	14.584
5	1.304	8.693	8.693						
6	1.066	7.110	7.110						
7	.719	4.792	4.792						
8	.493	3.285	3.285						
9	.346	2.306	2.306						
10	.319	2.126	2.126						
11	.255	1.700	1.700						
12	.146	.971	.971						
13	.074	.494	.494						
14	.032	.215	.215						
15	.028	.185	.185						

Extraction Method: Principal Component Analysis.

Table 6.3 Rotated Component Matrix

	Component			
	1	2	3	4
the bandwidth affects information adoption	.035	-.118	.887	.025
the network coverage affects information adoption	.883	-.205	-.063	.060
the network congestion affects information marketing	.901	-.249	-.104	.097
the network security affects information marketing	-.649	-.342	-.040	-.103
the network survivability affects information marketing	.011	-.295	.071	-.100
database availability affects information adoption	-.013	.054	.929	-.109
database reliability affects information adoption	.197	.604	.241	-.055
data transfer delay affects information adoption	-.147	.084	-.050	-.662
data loss rate affects information adoption	-.283	.020	.068	.902
call drop rate affects information adoption	.834	.022	.040	-.158
voice quality affects information adoption	.239	.154	-.148	.720
efficient service restoration affects information adoption	-.069	.938	-.128	-.074
variation in response time affects information adoption	-.113	-.292	.587	.522
quality of handset affects information adoption	.523	.298	.354	.235
software reliability affects information marketing	-.152	.884	-.084	-.109

Extraction Method: Principal Component Analysis.  
Rotation Method: Varimax with Kaiser Normalization.  
a. Rotation converged in 5 iterations.