User-Specific Service Generation: A Morphological Approach to Customized Blog Creation

Namjoong Kim[1], Hyojeong Lim[1], Sookyeong Seo[1],
Yoo Suk Hong[1,2,*], and Yongtae Park[2]

[1] Graduation Program in Technology and Management, Seoul National University, Korea
[2] Department of Industrial Engineering, Seoul National University, Korea
yhong@snu.ac.kr

Abstract. As the growth of service industry, new service creation has become as important as traditional view on new product development. It is particularly recognized that users want customized services for their intention. This study weighs blog-service characteristics (functions) based on user intentions and suggests a new service design method to combine functional levels among the existing blog service characteristics to meet each user intention. This research conducts online surveys to identify different user intentions, clusters them into five user intention groups, and then determines functional levels for a specific blogger group for an exemplified application. Morphology analysis is used to combine functional characteristics and the existing service levels at each function to generate a new blog concept for the target user group.

Keywords: new service generation, morphology, web service, blog.

1 Introduction

'Blogging' has exponentially increased as an online activity and has been fueled by reports from mainstream media of the massive power of blogs as an alternative news source since 1999, especially in the aftermath of 9/11 and the Iraq war. As web 2.0, which is the trend represented by information share and participation, has made blogs rapidly diffused, people use blogs to exchange their thoughts each other and participate in discussing social issues.

When blogs are firstly introduced into Korea, they did not intend to be used for participating in the social issues but for building social networks. Another trend occurred as the diffusion of Cyworld. It is the first successful online service as personal media and strongly focused on building social relationship. However, as nowadays portal sites such as naver.com, yahoo.com, daum.net are adopting blog services as a way of new services and blog-specified sites are becoming more popular, blogs settle down as a personal media just as in the western countries.

While blogs become one of the major online services, research in various fields has been conducted. In social engineering, some studies have been progressed to examine

* Corresponding author.

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why people use blogs and how bloggers behave. Moreover, a number of marketing managers have interests in so-called 'buzz effects' through blogs. On the other hand, computer science researchers and designers have tried to approach to blog concept generations based on functions and suggest more efficient interface designs. However, there has not been much research on the linkage between social engineering and computer engineering fields. Combined with user intentions in the area of social engineering, blogs have to support some important functions to customize for specific user needs, which are designed by engineers. Therefore, research to link between the user intentions and functions of blogs is required.

In this research, we explore which functional characteristics of blogs should be focused according to different user intentions and pursue an effective combination between functional characteristics and existing blog services in order to generate a new blog concept for an exemplified target user group.

2 Literature Review

2.1 Definition of Blogs

The term 'blog' is a combined word between 'web' for the Internet and 'log' for an official written account of what happens each day. The first generation of blogs starts in 1991 as a personal website of Tim Berners-Lee, who is the creator of World Wide Web services [1]. Blogs are defined as frequently updated web pages with a board in order that recently posted articles comes at top, distinguishing them from the traditional web pages that are not frequently updated and from board-type homepages [2]. Since blogs have rapidly evolved and still changed the patterns, the definitions and characteristics of blogs have not yet been clearly clarified. Meanwhile, blogs are defined with some basic characteristics as an unedited voice of a person, a diary-type board in order of recent updates to old articles, exposure of both titles and contents in the front page, frequently updated web pages by daily online posting, entry and post saved as HTML document with characteristics of publication, reflection and permalink, articles posted with mainly short content, categorized and networked by track back [3].

The wider definition is suggested by Blood that blogs are personal website for posting articles with users' own interests [4]. Blood classifies blog types into three types according to contents: log-style blog contains short memos of personal daily lives; filter-style blog includes news articles mainly focusing on social issues; and notebook-style blog is a mixed type between the other two, dealing with quite long articles about bloggers' own feelings and thoughts on their daily lives and social issues.

Blogs can also be classified into homepage, portal, and professional types [2, 5]. First, homepage type blog is used to maintain friendship among users in their 10s and 20s. Second, portal type blog is provided by portal web sites, which enables users to easily scrap any content from the portal sites into their own blog pages. Third,

blog-specified sites have more advantages in terms of flexibilities to control menus than homepage type and portal type blog, as well as provide a good quality of content and information.

This paper suggests a new typology of blogs. In addition to previous three types of blogs, installation type blog is included as a new type of blog, which users are able to install programs for managing and operating their own blog environment such as skins and BGMs through modifiable source codes. Naver blog(blog.naver.com), Cyworld(www.cyworld.com), Egloos(www.egloos.com), and Tattertools (www. tattertools. com) are selected as representatives for portal, community, blog-specified, installation type of blog respectively.

2.2 User Intentions of Blogging

Various types of blogs meet different user needs with unique services, and the users seldom switch their blog services. This is what sociology researchers concerned about to which function people expect for blogs. The user intentions of blogging include social relationship/public sharing, self-satisfaction, social/business purposes and distinction of intergroup in extents of usage [6]. Moreover, existing user intentions of online communities with priority given to blogs are one of the online communities [7]. For example, user intentions are characterized by the following ten factors: representation of identification, memory sharing, studying tool, documen-tation, epidemic, habit, interaction, pride, voyeurism, and publication of image.

Thus, these 10 factors representing user intentions are tested in this research by online survey.

2.3 Functional Characteristics of Blogs

Blog functions are diversified. Even though design components of blogs change with variability, there are six essential functions of blogs [8]. They are 1) archives that make recent articles come first, 2) comment system with which visitors append reply, comment and remote comment on articles. Blogs support 3) categorization of articles, and provide 4) permalinks, through which one can move to the original article and blogs that locate in head or back link of posting. 5) Trackback function of blogs provides continuous public sharing of contents in similar interests and among people, which therefore contributes to make a powerful community in the same interest. Finally, a search tool in blogs is convenient not only to search for previous postings but also to give a guide to who drops in blogs through web searching.

2.4 Method of New Service Development

Sequential models for new product or service development have been investigated by several researchers [9, 10, 11]. These sequential models are made up of well-defined steps, as illustrated by the *stage-gate* model [10]. This research focuses on the service generation stage in the sequential process of service development.

The former research uses conjoint analysis and the theory of inventive problem solving (TRIZ) to generate new services, which are also traditional methods to develop new products [12]. However, since those models have limitations that there are fundamental differences between products and services, a new service development process has to be treated with more flexibilities and generalities than the new product development process [13].

This research suggests a morphology-based method for a service concept generation to increase flexibility and generality of service changes.

3 Research Hypothesis

Tried to observe from preceding research, the intentions of blogging are already revealed by differences of every each person in sociology field. It is possible to guess that users who have different intention of using can select blogs on their taste. Therefore our objectives are to clarify the important components according to user intentions and to suggest a new blog concept for a specified blogger group.

Hypothesis 1. User intentions of blogging are divided into several groups.
Hypothesis 2. Each user group emphasize on different functional characteristics of blogs.

After testing *Hypothesis 1*, one of the user intention groups is targeted to develop a new blog concept. Then once *Hypothesis 2* is tested, specific functional characteristics for the targeted bloggers are selected from the existing service options, focused on the weights of functional characteristics.

4 Methodology

4.1 Morphology Analysis

Morphology analysis is famous for its systematic approach to generate ideas traditionally for a product development. A morphological matrix is composed of the rows of key parameters at each product or service design level and the columns of available alternative components. Therefore, several combinations of selected alternatives at each key parameter can be new ideas [14, 15].

While the method is simple and reasonable, it has a serious limitation that the number of possible ideas is too large to consider all the alternatives. To solve this problem, a weighted morphology matrix is suggested in this research for an efficient parameter selection. A weighted morphology matrix is constructed according to the survey results on the functional characteristics of four different existing blog services, and then the service levels with the highest weight score at each functional characteristic are selected to efficiently make an alternative combination among the functional characteristics and existing blog services.

4.2 Variables and Measurement

Survey questionnaires are composed of five user intentions, 12 important functions and user satisfactions in each function for bloggers. The user intention consists of self-satisfaction, social/business purposes, friendship, storage of information, and representation of identification, which will be tested by confirmatory factor analysis. Respondents are asked with questionnaires for those user intentions and satisfactions on the blog functions, which are measured by 5-point scale (the same items used in the research for [6, 7]).

4.3 Data and Methodologies

Online survey is conducted to gather data on user intentions and importance of functional characteristics at each consistent user group. The survey is progressed by randomly selected bloggers. Out of total 298 answers received from the survey, 287 data except for 9 unreliable data are used for analysis[1]. Then the averages, frequencies, rates of variables are calculated and ANOVA is taken to see if there are statistically significant differences among blog types.

5 Results and Discussions

5.1 Results of Reliabilities Test and Factor Analysis

Before analyzing the survey results, a Cronbach's alpha test is conducted to check if there are internal consistencies among survey questionnaires explaining five factors of user intentions. Out of total 20 survey items asking bloggers of user intention, 16 items prove to have significant reliabilities with satisfactory Cronbach's alpha coefficients over 0.7 except for the other four items with values under 0.6, which are therefore excluded from the analyses. The results of factor analysis for user intentions confirm the five dimensions as designed for the survey questionnaires in Table 1: self-satisfaction (26.03%), social/business purposes (14.77%), relationship management (10.87%), information storage (10.39%), and expression of personality/identity (6.51%). The overall explanatory capability of these five factors is 68.57 %.

5.2 Hypothesis Testing

In order to test *Hypothesis 1*, ANOVA is conducted to examine if there are significant differences in user intentions among four different blog types.

With the assumption of homoskedasticity, ANOVA result with Levene statistics is statistically significant at a 0.05 level, which means the variances of five factors for user intentions do not follow the assumption of homoskedasticity among different blog types. Therefore, ANOVA without homoskedasticity is conducted, and then post-hoc Tamhane T2 and Dunnett T3 statistics are tested.

[1] 287 people (150 males, 137 females) participated in the survey (Under 20 years old: 71 people, 21~30: 182, 31~40: 30, Above 41: 4).

Table 1. Result of factor analysis on user intention of blogging

	Factors				
	1	2	3	4	5
Expression of own feelings and thoughts	**.848**	.030	.110	-.076	.075
Documentation of daily life	**.789**	.019	.200	.069	-.023
Self-reflection	**.714**	.307	.083	-.061	.141
Personal usage	**.692**	-.017	-.259	.059	.157
Getting to know social issues	.135	**.845**	.052	-.020	.115
Participation to discuss social issues	.019	**.755**	.215	.101	-.091
Helpful information for study/business	.075	**.745**	.094	.269	.063
Communication with others through blogs	.092	.120	**.823**	.037	.042
Exchange with information and ideas	.026	.382	**.742**	.115	.117
Importance of number of visitors and comments on the blog	-.097	-.112	**.668**	.154	.368
Helpful way to understand other people	.325	.329	**.538**	-.210	.043
Blog as a scrapped book	-.049	.036	-.094	**.862**	-.028
Scrap of good information or articles from other sources into my own blog	.012	.099	.136	**.839**	.125
Blog as a knowledge warehouse	.047	.445	.171	**.602**	.107
Importance of good-looking blogs	.079	.078	.189	.104	**.865**
Blog as the reflection of my characteristics	.205	.037	.103	.027	**.864**

Factor extraction method: PCA.
Rotation method: Verimax with Kaiser Normalization. a. Factor rotation converged after 6 iterations.

Table 2 shows descriptive statistics of means and standard deviations of the five factors according to four different blog types. While Egloos blogs intend to be used as a way of self-satisfaction (0.207), Cyworld mini homepages seem to use for personal uses with minus value (-0.650) for social/business purposes. Naver and Egloos blogs provide relationship management functions with mean value 0.07, Naver bloggers tend to have information storage purposes (0.452) rather than Egloos and Tattertools. Also, Naver bloggers highly intend to express their personality/ identity (0.221) through the blogs. However, those user-wise comparisons according to each blog type need to be clarified by ANOVA test and the post-hoc test.

Table 2. Descriptive statistics of user intention of blogging

	Cyworld(61)	Naver (71)	Egloos(112)	Tattertools(36)
Self-satisfaction	-.108(.936)	-.159(1.16)	**.207**(.813)	-.146(1.190)
Social/business purposes	**-.649**(.815)	.181(1.078)	.112(.942)	.393(.828)
Relationship management	-.196(.994)	**.070**(.993)	**.075**(.969)	-.040(1.107)
Information storage	.284(.909)	**.451**(1.056)	-.405(.800)	-.109(1.094)
Expression of personality/ identity	-.003(.985)	**.221**(1.040)	-.148(.928)	.031(1.112)

Number with blog's name means each blog users number from the survey.
Data are presented with a format 'mean(stan. dev.)'.

The result of ANOVA test in Table 3 shows significant differences in the mean values among four blog type of user groups in the factors of self-satisfaction, social/business purposes, and information storage within 5% significance level, while

those in the factors of relationship management and expression of personality/identity are not significant. Therefore, *Hypothesis 1* that supposes different blogger groups have different user intentions is partially supported. Post-hoc Tamhane T2 and Dunnett T3 tests prove the multiple comparisons of each blog type. In the comparison of blog types for the social/business purposes, Cyworld users with lower intention to this are generally different from the other groups. As for use for information storage, there are significant differences that Naver bloggers have a higher intention while Egloos users have a lower intention.[2]

Table 3. Result of ANOVA test on the differences among blog user groups

	Differences	Sum of squares	Deg. of freedom	Mean square	F	p-value
Self-satisfaction	Between groups	8.13	3	2.71	2.76	**.042**
	Within groups	270.87	276	.98		
Social/business purposes	Between groups	35.06	3	11.68	13.22	**.000**
	Within groups	243.93	276	.88		
Relationship management	Between groups	3.40	3	1.13	1.13	.335
	Within groups	275.59	276	.99		
Information storage	Between groups	38.28	3	12.76	14.63	**.000**
	Within groups	240.71	276	.87		
Expression of personality/ identity	Between groups	5.98	3	1.99	2.01	.112
	Within groups	273.01	276	.98		

Hypothesis 2 is tested to see if the user groups by the four different blog services can be re-clustered by the importance of blog sub-functions from their usage. First, the correlation coefficients between the important levels of twelve blog sub-functions and five factors of user intentions are calculated. The correlation between information storage and scrap, as well as between expression of personality/identity and makeup of blogs are significant with coefficient over 0.4, while other sub-functions and factors of user intentions are not significantly correlated. Second, four regression analyses are conducted with each user intention as the dependent variable and all the blog sub-functions as independent variables. After the regression analyses, independent variables are finally selected by the backward selection method.

From the results of each regression analysis the followings are revealed: people using blogs for self-satisfaction need the functions of board/article posting and flexibility of menu control, whereas plug-ins and track back functions are more important to people using blogs for social/business purposes; the interactivity with friends and the RSS functions is significantly essential to bloggers who manage friendship through blogs, and bloggers who want to express their personality and identities emphasize on making-up their blogs. The conclusion through these results is that important sub-functions of blogs are varied according to user groups with different user intentions. Thus, *Hypothesis 2* is supported.

[2] While Naver users gave high scores (0.452) to information storage purpose, Egloos users gave low scores (-0.406) to this, which results in the group differences with the significant level near 0.

5.3 Application of a New Concept Development: Morphology-Based Case Study

As previously mentioned this research assumes that there is a specified user group with user intention and suggests a new blog concept.

The first step is to re-cluster the integrated users with variables of user intentions. This enables to select a specified target for a case study, therefore from which a new blog concept is generated. To re-cluster the sample, five factors of user intention are selected as variables for k-means clustering method. The value of k is determined as five by an ex-ante hierarchical clustering analysis and calculation of the distances among cluster centers. As the result of the cluster analysis is shown in Table 4, Clusters 1-5 are characterized as a group for information scrap, self-satisfaction, personal expression, social/business activities, and relationship management, respectively.

Table 4. Result of 5-means clustering

	No. of user clusters (no. of cases in each cluster)				
	1 (59)	2 (68)	3 (42)	4 (46)	5 (65)
Self-satisfaction	.349	**.600**	-1.480	-.265	.199
Social/business purposes	.063	.083	-.027	**1.106**	-.910
Relationship management	.055	-.963	-.376	.630	**.754**
Information storage	**1.279**	-.416	-.223	-.156	-.471
Expression of personality/ identity	.293	-.021	**.662**	-.722	-.160

In the investigation of each blog to see the distribution of clusters 1-5 in each blogger groups, it shows that each cluster is included in one user group with different ratios. This result shows that each blog has lured the bloggers with various user intentions by using distinctive service functions.

The next step is to target a specified user cluster and develop a new blog concept. In this research, the user cluster 2 (self-satisfaction) is selected for a morphology-based case study. In the morphology matrix, the score of alternative technologies is calculated by averaging the satisfaction score on the design parameters from whom are in the target user cluster 2. The important levels of each sub-function provided by the target user cluster 2 are shown as design parameter's weight in Table 5. Alternatives are evaluated and selected by one of the maximum weighted values.

The highlighted items in Table 5 are the results of this newly suggested approach with the maximum score among the alternatives. The combination of the resulted alternative items suggests a new blog service that intensifies the scrap of articles, interactivities with neighbors, and RSS functions for a target cluster 2. As for scrap function, Naver blog has been given more scores, which reflects the fact that Naver is a portal type blog so that it can be enable users to scrap contents from 'Naver news' or 'Jisik-iN[3]' services. Therefore, this function can be constrained unless the new concept of blogs includes various sources of contents. An easy way to approach to this is to enlarge the compatibilities with portals or other content websites. In terms of interaction with neighbors, services are provided by Egloos have the highest value to consider the design parameter. Since Egloos provides a simple neighboring

[3] An open knowledge-sharing house and dictionaries for Naver portal users, where Q&As actively occurs regarding any issues ranged from personal interest to professional areas.

management system with link to neighboring blogs and list of recent visitors, while Cyworld and Naver blogs provide more powerful operations. This result shows that a complicated neighboring system such as Cyworld is not important to target cluster 2. For operations of skin/accessories, installation type blogs such as Tattertools has significantly high score since the flexibilities in its source codes are higher than others.

Table 5. Morphology matrix for a new blog concept generation targeting user cluster 2

Design parameters (weight)	Cyworld			Naver			Egloos			Tattertools		
	Mean	N	σ	Mean	N	σ	Mean	N	σ	Mean	N	σ
Scrap (2.72)	3.44	9	0.73	3.73	11	1.10	3.11	18	1.08	2.63	8	1.19
Posting/editing of articles (4.72)	3.00	10	0.82	3.75	12	0.97	3.86	36	0.93	3.90	10	0.88
Selection of categories (4.41)	2.90	10	0.74	3.83	12	1.11	3.81	36	0.86	3.44	9	1.01
Control/storage of articles (4.41)	2.90	10	0.74	3.92	12	1.00	3.89	36	0.89	3.90	10	0.74
Structure of menus (4.20)	2.78	9	0.83	3.25	12	1.06	3.69	36	0.92	3.30	10	1.16
User interface (4.20)	2.63	8	0.92	3.50	12	0.80	3.64	36	0.87	3.70	10	0.82
Administration mode(4.20)	2.00	9	0.87	3.00	12	1.04	3.69	36	0.95	3.50	10	0.97
Statistics of visitors (3.40)	2.22	9	0.67	2.91	11	1.14	3.61	36	1.15	3.33	9	1.00
Link to neighboring blogs (3.40)	3.50	10	0.53	4.00	11	1.00	3.85	33	1.00	3.00	9	0.87
Relationship management (3.40)	3.11	9	0.60	3.09	11	1.38	3.24	33	1.03	2.67	9	0.87
Skin/accessories of blogs (3.35)	2.78	9	1.09	3.00	11	1.26	3.24	34	0.89	3.56	9	1.13
Plug-ins (3.14)	1.83	6	0.75	2.67	9	1.41	2.67	18	0.77	3.78	9	0.97
RSS (3.31)	3.00	6	0.89	3.22	9	1.48	3.43	23	0.95	3.56	9	0.88
Track back (3.45)	2.67	6	0.82	3.13	8	1.73	3.82	33	0.77	3.50	8	0.76
Modification of source (4.13)	2.80	10	1.48	3.08	12	1.38	3.46	35	1.12	3.70	10	0.95
Limits to data storage (4.09)	1.56	9	0.73	3.17	12	1.11	3.30	33	1.19	3.70	10	1.16
Level of content security (4.09)	3.30	10	1.25	3.58	12	1.24	3.69	36	1.09	4.30	10	0.67

6 Conclusions

This paper confirms that user intentions of blogging are characterized by five factors such as self-satisfaction, social/business purposes, relationship management, information storage and expression of personality/identities. In addition, this paper examines that four various types of bloggers have differences in the preference of blog sub-functions depending on the five factors of user intentions. Based on the survey data, users of four different blog types (Cyworld, Naver, Egloos and Tattertools) are regrouped into five distinct clusters classified by user intention factors. To develop a new blog concept for a specific user group, a morphology-based approach is proposed to generate alternatives with various levels of new blog sub-functions. In this research, one of the five clustered user groups is selected and a morphology-based concept generation is conducted to the clustered group 2 in which users tend to fulfill self-satisfaction through their blogs.

The new concept generation approach has a potential to be a good tool to examine the characteristics of bloggers according to the user intentions. However, since the morphology matrix that is calculated from the survey results has a small number of cases in each cell, the mean value of each cell is hardly reliable. Also, the verification of a new blog concept will be discussed further as the success of new blogs not only

depends on the right targeting and right services for the targeted user groups but also the other management capabilities such as marketing, etc. Therefore, future research will include clarification of how the design parameters are combined with blog sub-functions in the existing blog services, and which features of blogs influence on the user satisfaction.

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